

PB-231 849

A STUDY OF EMISSIONS FROM 1966-1972
LIGHT DUTY VEHICLES IN LOS ANGELES
AND ST. LOUIS

Automotive Environmental Systems,
Incorporated

Prepared for:

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16. ABSTRACT A comprehensive study of exhaust and evaporative emissions from light duty vehicles was performed in Los Angeles, California; and St. Louis, Missouri, to determine the contribution to atmospheric pollution by 1966 through 1972 model year vehicles. This study was part of a total effort to measure the emissions from light duty vehicles in six cities. Exhaust emissions tests on 170 vehicles in Los Angeles, California; and St. Louis, Missouri, and evaporative emissions tests on twenty 1972 model year vehicles in Los Angeles, California were performed. These tests determined the levels of hydrocarbons, carbon monoxide, carbon dioxide and oxides of nitrogen exhaust emissions as well as hydrocarbon evaporative emissions. The strategy for test fleet selection, procurement and logistics are described. The facilities and equipment are described and include: test location; constant volume sampler; exhaust analysis console; SHED and fuel conditioning cart; chassis dynamometer; and miscellaneous equipment. The test procedures and data handling are described. Vehicles were tested for exhaust emissions using the 1975 Federal Test Procedure. This allowed calculation and presentation of results by both the 1972 and 1975 procedures. Evaporative emissions were measured using the Sealed Housing for Evaporative Determinations technique in general accordance with procedures stipulated in SAE Technical Report J171.		
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AND ST. LOUIS**

Prepared by

**Automotive Environmental Systems, Inc.
7300 Bolsa Avenue
Westminster, California 92683**

Contract No. 68-01-0456

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Prepared for

**U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Water Programs
Mobile Source Air Pollution Control
Certification and Surveillance Division
2565 Plymouth Road
Ann Arbor, Michigan 48105**

August 1973

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1. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has recognized the problem of air pollution due to motor vehicles and has assigned a high priority to the control and measurement of emissions from light duty vehicles. In addition to establishing emissions control standards, to which all new vehicles manufactured must comply, the EPA has maintained an ongoing effort to survey emissions from "on-the-road" vehicles. This ongoing effort is to develop and update accurate emissions factors which quantify the exact contribution to atmospheric pollution by light duty vehicles. Once emissions factors are known and the proper segment of the air pollution inventory is assigned to motor vehicles, the effectiveness of current emissions control strategies can be established and updated. The acquisition of this information on a continuing basis will assist the EPA in evaluating control strategies with respect to control results. Furthermore, emissions factors information will assist in the prediction of serious air pollution episodes in densely populated areas.

In 1971, the EPA sought to precisely assess the light duty vehicle's contribution to atmospheric pollution in six metropolitan areas using the latest emissions measurement technology. These new techniques accurately quantified the true amounts of pollutants entering the atmosphere from light duty motor vehicles. The six cities selected were representative of some of the most populated areas in the United States as well as the most diverse areas in terms of climate and terrain--Los Angeles representing the temperate, warm and sunny western portion of the United States and Denver, at a one mile altitude, representative of the mountainous metropolitan areas. Chicago was selected to represent the Great Lakes and northeast region of the United States, typical of cities with long winter seasons. St. Louis and Houston were selected as representing the typical extremes in the Great Plains area with St. Louis experiencing rather moderate winters and Houston normally having a very warm, but also a very humid climate. The sixth city selected was Washington, D.C., typical of the many cities on the Eastern Seaboard.

The Environmental Protection Agency sought, in 1972, to update the light duty vehicle pollution inventory on 1966 through 1972 model year vehicles

in six cities and awarded the contract "Light Duty Vehicle Surveillance Program Fiscal Year 1972 (Los Angeles and St. Louis)" to Automotive Environmental Systems, Inc. The description and results of this program for these two of the six cities are presented in this final report.

2.1 PROGRAM OBJECTIVE

The overall objective of "A Study of Emissions From 1966 through 1972 Light Duty Vehicles in Six Cities" was to gather accurate exhaust and evaporative emissions data which are statistically representative of the nation's vehicle population. These data will be used to develop average emissions factors which precisely define emissions characteristics from light duty vehicles in the United States. The average emissions factors are to be used by the National Air Data Branch (NADB) and the Land Use Planning Branch (LUPB) of the United States Environmental Protection Agency, to determine the contribution of light duty vehicles to the national air pollution inventory. These factors will enable NADB to project vehicle emissions levels which may be used in metropolitan areas to anticipate pollution episodes or to assist in the evaluation of pollution control strategies such as transportation control. In addition, this program will update vehicle exhaust emissions data on 1966 through 1971 model year vehicles and provide exhaust and evaporative emissions data on 1972 model year light duty vehicles.

2.2 PROGRAM DESIGN

In support of the broad objective of this program to accumulate evaporative and exhaust emissions data which will provide an accurate measure of the automobile's contribution to the nation's emissions inventory, several subordinate objectives had to be fulfilled. The first, and perhaps most important, was to ensure that the sample from which vehicle emissions data was obtained was statistically representative of the nationwide population. This task was accomplished by testing a statistically representative sample of vehicles in six cities located across the United States. Three contractors were selected by the Environmental Protection Agency to perform these tests. General Environments Corporation tested vehicles in Washington, D.C., and Automotive Testing Laboratories performed emissions testing in Denver, Colorado; Houston, Texas; and Chicago, Illinois. In this program, AESi tested vehicles in Los Angeles, California, representative of the warm and sunny western portion of the United States; and in St. Louis, Missouri, typical of the Great Plains area of the United States.

Another important consideration in support of the overall program objective was the proper selection of test vehicles, model years 1966 through 1972. The 1972 model year vehicles were tested to generate exhaust and evaporative emissions data and the 1966 to 1971 vehicles were tested to up-date data generated in last year's program. In any statistical sampling program, there is always concern about the statistical validity of the sample. A careful delineation of the various vehicle makes, engine sizes, transmissions and carburetion types was obtained, and a desired national test vehicle sample was developed by the Surveillance Branch, Office of Air & Water Programs, of the Environmental Protection Agency.

Another important consideration in support of the program objective was the orderly accumulation of precise test data. Therefore, precision test equipment, well defined procedures, and rigorous qualification, calibration and cross check techniques were used in the program.

In order to accumulate accurate exhaust and evaporative emissions test data from the vehicle sample, techniques which measure the true polluting characteristics of vehicles were required. The constant volume sampling

technique as specified in the 1972 and 1975 Federal Test Procedures was used to measure the pollution characteristics of the test vehicles.

The evaporative emissions test procedure used for testing in Los Angeles was the Sealed Housing for Evaporative Determinations (SHED) technique. This technique consists of placing the car in an enclosure and measuring the concentration of evaporated hydrocarbons in the atmosphere within the enclosure.

2.3 TEST VEHICLE PROCUREMENT

2.3.1 Selection Procedure

The objective of the test vehicle procurement task was to obtain test vehicles of the appropriate make, model and age which are representative of the nation's vehicle population. To satisfy this goal, AESi used a selection procedure for choosing the vehicles for the program test fleet. The selection procedure is depicted in Figure 2.3-1.

For each of the two cities, an nth-name sample of 1966 through 1972 automobiles registered in the test locations (as defined by postal zip codes) was obtained from R. L. Polk and Company. The nth-name sampling technique used by Polk results in the selection of a random sample by selecting the vehicles whose owners reside at every nth street address within the sample area, where:

$$n = \frac{X}{Y}; \text{ where } X = \text{Total number of vehicle owners per city} \\ \text{and } Y = \text{Sample size}$$

The randomly selected names for each city were submitted to AESi on magnetic tape--10,000 for Los Angeles and 5,000 for St. Louis.

A subsample of vehicles which best fits the national vehicle population profile of make, model year and number of engine cylinders was selected for each city. Later this list was reduced to those vehicles which best fit the vehicle matrix furnished by the Office of Air & Water Programs of the Environmental Protection Agency. The subsample as selected by the computer was printed out in the format shown in Figure 2.3-2.

A mailing consisting of a letter and a postage-paid return card as shown in Figures 2.3-3 and 2.3-4 was sent to each of the vehicle owners selected in the subsample. The aura of "junk mail" was minimized by typing names and addresses of the selected vehicle owners on the letters and envelopes.

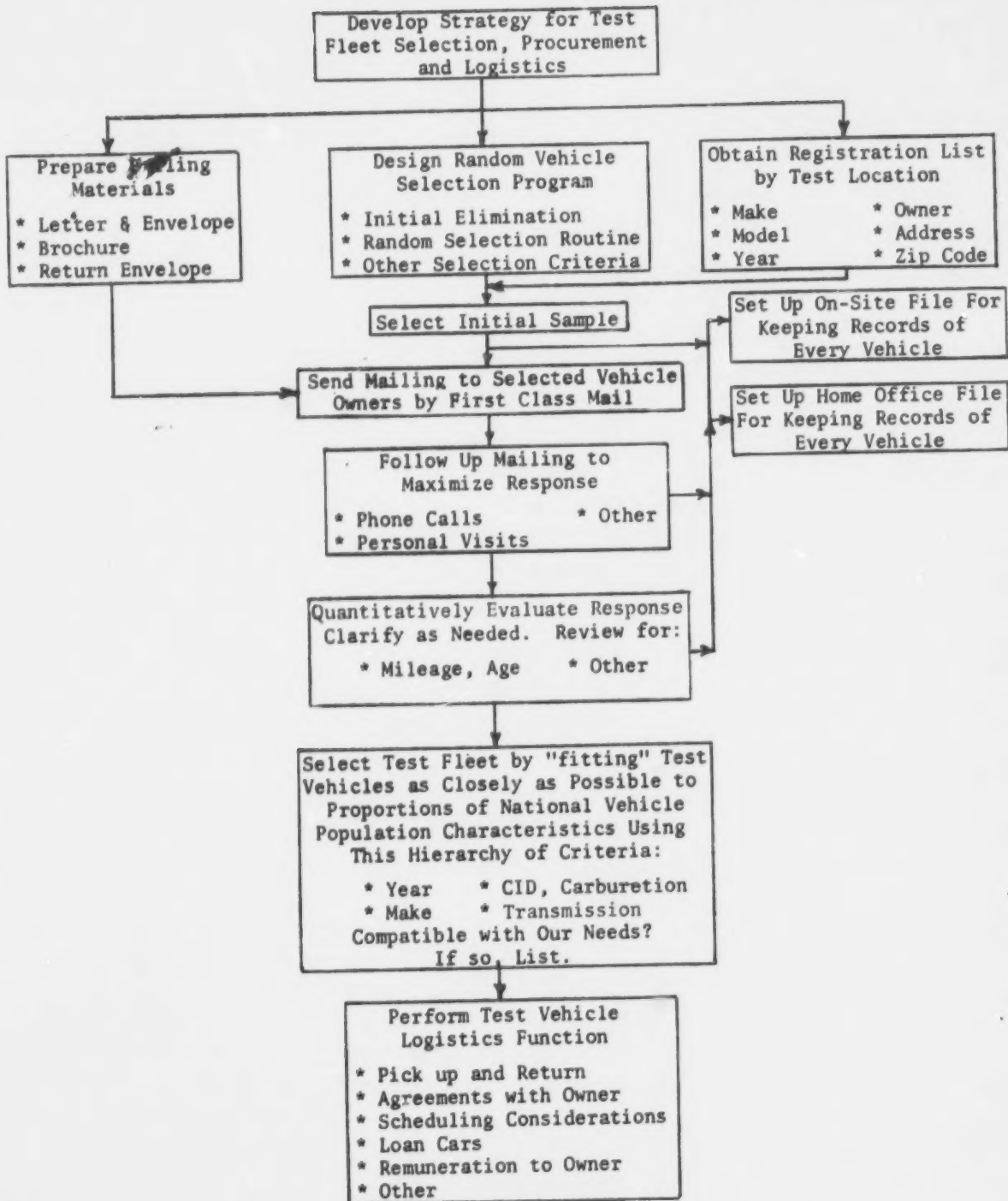


Figure 2.3-1 Vehicle Procurement Flow Diagram

10,000 LOS ANGELES CARS BY MAKE AND YEAR

SEQ#	NAME	ADDRESS	YE	MFGR	MODEL	CYL	COST	TRANS	CARB	CID
28	MR. L P CITRON	3361 MC LAUGHLIN AV LOS ANGELES CA 90066	71	BUICK	BU1	8	3			
29	MR. I B COOPER	6022 PICO BL LOS ANGELES CA 90035	71	BUICK	BU1	8	4			
30	MR. J D BURDEN	1428 225TH ST TORRANCE CA 90501	71	BUICK	BU1	8	4			
31	MS. J M BRILES	5 MIDDLEIDGE LN PLS VRD PMSLA CA 90274	71	BUICK	BU1	8	4			
32	MR. A GRIFFIN	704 111TH ST LOS ANGELES CA 90044	71	BUICK	BU1	8	4			
33	MR. L J DRESSLER	32653 SEA GATE DR PLS VRD PMSLA CA 90274	71	BUICK	BU1	8	4			
34	MR. E DEAS	6329 10TH AV LOS ANGELES CA 90043	71	BUICK	BU1	8	4			
35	MR. H ESSERMAN	1200 WOODSTER ST LOS ANGELES CA 90035	71	BUICK	BU1	8	4			
36	MR. J J KUDINA	17015 YUKON AV TORRANCE CA 90504	71	BUICK	BU1	8	3			
37	MR. J J LEHMAN	643 8TH ST SAN PEDRO CA 90731	71	BUICK	BU1	8	4			
38	MR. M JONES	509 PEACH ST COMPTON CA 90222	71	BUICK	BU1	8	4			
39	MR. R M JONES	3513 OCEAN VIEW AV LOS ANGELES CA 90044	71	BUICK	BU1	8	4			
40	MR. N W KENDALL	30327 VIA BUREA PLS VRD PMSLA CA 90274	71	BUICK	BU1	8	5			
41	MR. E D McTAGGART	6400 BEACHVIEW DR PLS VRD PMSLA CA 90274	71	BUICK	BU1	8	4			
42	MR. C O JAMES	325 139TH ST LOS ANGELES CA 90061	71	BUICK	BU1	8	5			
43	MR. E D MUELS	1126 109TH PL LOS ANGELES CA 90044	71	BUICK	RIV	8	5			
44	MR. C P CARR	4827 6TH AV LOS ANGELES CA 90043	71	BUICK	RIV	8	5			
45	MR. B B COOPER	1507 GUMLOCK ST COMPTON CA 90220	71	BUICK	RIV	8	5			
46	MR. T J SIMON	916 THORSON AV COMPTON CA 90221	71	BUICK	RIV	8	5			
47	MR. D A MASSON	3663 STONER AV LOS ANGELES CA 90066	71	BUICK	RIV	8	5			
48	MR. C E BURKE	1559 CARDIFF AV LOS ANGELES CA 90035	71	BUICK	RIV	8	2			
49	MR. T H CREIGHTON	3801 PIRATE DR PLS VRD PMSLA CA 90274	71	BUICK	SPL	8	2			
50	MR. J L KANASTER	4005 VIA GAVILAN PLS VRD PMSLA CA 90274	71	BUICK	SPL	8	2			
51	MR. D G MITCHELL	3704 VIGILANCE DR PLS VRD PMSLA CA 90274	71	BUICK	SPL	8	2			
52	MS. I LILLIS	3372 CABRILLO BL LOS ANGELES CA 90066	71	BUICK	SPL	8	2			
53	MS. L T MARTIN	3310 76TH ST LOS ANGELES CA 90043	71	BUICK	SPL	8	2			
54	MR. C E WATSON	317 83RD ST LOS ANGELES CA 90003	71	BUICK	SPL	8	2			

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AESi

AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC. ■ 7300 BOLSA AVENUE, WESTMINSTER, CALIFORNIA 92683 ■ 714 897-0331

Reply to:

7300 Bolsa Avenue
Westminster, California 92683
714-897-0331

Dear Vehicle Owner:

You may be able to make an important contribution towards controlling the nation's air pollution problem, and receive a \$25 U. S. Savings Bond for your cooperation.

As you may know, the U. S. Environmental Protection Agency is conducting an important testing program for vehicle exhaust pollution in six major metropolitan areas: Chicago, St. Louis, Denver, Los Angeles, Houston and Washington, D. C. Our organization has been selected by the Government to perform these tests in this area. We are writing you because your vehicle has been randomly selected as a candidate for testing.

Enclosed is a postpaid reply card which you should complete and return at your earliest convenience. Printed on the card is the model year and make of a vehicle registered in your name. Please indicate if you still own this vehicle, and if you are willing to submit it to our laboratory where it will be tested under simulated normal driving conditions. No unusual operations will be performed and no adjustments will be made to your vehicle. It will be fully insured while in our possession.

We have been authorized by the Environmental Protection Agency to award a \$25 U. S. Savings Bond to each participant whose vehicle is tested. Also, if you wish, we will provide you, free of charge, a late-model, fully-insured rental car for your use during the time your vehicle is being tested.

We know you will want to be a part of this important project. Please complete and return the enclosed postage-paid postcard today. We will contact you shortly to schedule the test.

Sincerely yours,

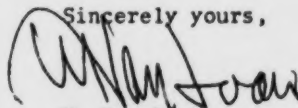
M. Van Loan
Vice President

Figure 2.3-3

FILL OUT, TEAR OFF AND RETURN POSTCARD TODAY! BUSINESS REPLY MAIL No Postage Stamp Necessary If Mailed In The United States Postage will be paid by AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC. Vehicle Emissions Testing Laboratory 7300 Bolsa Avenue Westminster, Ca. 92683	FIRST CLASS Permit No. 1471 San Bernardino Ca. Form No. 4505-Z Yes, I am willing to volunteer my car for pollution testing ☐ Make of car _____ Year _____ Model _____ My car's engine displacement is _____ cubic inches Serial Number _____ Carburetor: 1 barrel ☐ 2 barrel ☐ 4 barrel ☐ Fuel Inj. ☐ Transmission: Automatic ☐ Manual ☐ Current mileage on my car is _____ Name _____ Street No. _____ City _____ Zip Code _____ Contact Date _____ Form Approved OMB No. 156-5-72033 Vol. No. _____ FILL IN IF YOU HAVE THIS INFORMATION Bus. Phone No. _____ Res. Phone No. _____ COMPANY USE ONLY
---	---

**FILL OUT, TEAR OFF
AND RETURN
POSTCARD TODAY!**

Figure 2.3-4

Concurrently with the mailing, AESi obtained the telephone numbers of all selected vehicle owners whose numbers were listed. Approximately one week after the mailing, AESi began to call and encourage all selected vehicle owners with listed telephone numbers to participate in the program. In some cases, selected vehicle owners were visited personally by the procurement specialists to obtain their cooperation. Also concurrently with the mailings, local newspapers and selected special interest groups were alerted about the program and encouraged to publicize it with the objective of encouraging selected vehicle owners to whom the mailings had been sent to submit the postage-paid cards to AESi.

After maximizing the response to the mailings, all selected vehicle owners who were willing to participate in the program were listed and resubmitted for a second level computerized selection. Based upon the additional vehicle parameters of cubic inch displacement, transmission type and carburetor type, as well as the original parameters of make and model year, AESi selected from the candidates those vehicles which best conformed to the EPA-furnished national vehicle population profile.

AESI personnel then contacted the owners of the selected vehicles and asked them to deliver their vehicles to the laboratory in accordance with the testing schedule. If the selected vehicle subsequently became unavailable for one reason or another, a spare vehicle was substituted for the initially selected vehicle. Advertising and other strategies were used in a limited number of instances to obtain certain hard-to-find models.

2.3.2 Test Vehicle Handling

Test vehicles were scheduled for testing at each of the laboratories in accordance with the respective laboratory work load and manpower capabilities. Accordingly, the scheduling of test vehicles was a critical task, especially since the vehicle owners were relied upon to deliver their vehicles to the laboratories. Arrangements were made with the owners of the candidate vehicles several days in advance, and the owners were again reminded of the appointments one day prior to the scheduled time of delivery.

Virtually all of the participants required loan cars while their cars were being tested. AESi arranged for the provision of such loan cars with full insurance in accordance with contractual requirements, through the services of Dollar-A-Day Rent A Car. From the standpoint of the rental car fleet at each test facility, scheduling was especially important, since each participant expected to be provided a rental car expeditiously upon his arrival at the laboratory. Unless a participant from the previous day had returned a rental car well in advance of the new participant's arrival, the new participant either had to wait for the arrival of a rental car, or additional cars had to be provided. In the interest of expediting the program and making it as convenient as possible for the participants, AESi chose to have additional loan cars on hand to ensure the immediate availability of loan cars for all participants delivering their test vehicles to the laboratory.

Each candidate in the program signed two documents in conjunction with the exchange of vehicles. The first document was a test agreement which absolved the participant of all liability relating to his vehicle while in the possession of AESi. The second document indemnified the participant from any liability arising from the use of the loan car.

To encourage participation, incentives were provided to each vehicle owner. The participant was supplied a free, fully-insured loan car while his car was being tested, and a \$25 U.S. Savings Bond. These incentives generally proved ample to obtain vehicle owners' cooperation. At the Westminster laboratory, an additional \$10 reward was offered to encourage people to deliver their vehicle to the laboratory when they refused to participate because of the inconvenience. This reward was accepted by ten participants who were in close proximity to the laboratory. For those vehicle owners who were more than 25 miles away this additional reward provided no additional incentive.

2.4 FACILITIES AND EQUIPMENT

2.4.1 Test Locations

Test facilities were established in the metropolitan areas of Los Angeles and St. Louis. In accordance with contractual requirements, both of the facilities were located within 10 miles of the metropolitan areas. Easy accessibility by the program participants was considered in selection of the specific locations. The address and elevation above mean sea level of each facility follows:

Los Angeles
7300 Bolsa Ave.
Westminster, California 92683
50 feet

St. Louis
10723 Indianhead Blvd.
St. Louis, Missouri 63132
400 feet

2.4.2 Constant Volume Sampler

The equipment described in this section was designed and built in accordance with requirements stipulated in pertinent issues of the Federal Register for performing vehicle emissions tests in accordance with the 1972 through 1975 Federal Test Procedures. An AESi-designed and fabricated Constant Volume Sampler was utilized in each city. Each of these constant volume samplers features a specially designed gas-to-water heat exchanger and temperature control circuit which allows for precise control of the sample temperature. Inlet pressure depression is adjusted by a precision butterfly valve enabling inlet pressure adjustments to within plus or minus 0.05 inches of water. Blower speed is maintained at a constant 1,125 revolutions per minute by the use of a constant speed motor. Blower revolutions are counted by the use of a magnetic pickup and an electronic counter. All function controls are push button operated giving a confirming visual indication when each particular function is being performed. Table 2.4-1 lists the performance specifications of AESi's constant volume sampler. Listed on the left are the specifications as itemized under Section 85.073-20 of the Federal Register, and on the right the performance specifications of AESi's constant volume sampler.

AESi Constant Volume Sampler - Performance Specifications

SPECIFICATION	AESi CVS PERFORMANCE
1. Must have two particulate filters plus one charcoal filter with a total pressure drop of less than 1" H ₂ O.	0.3" - 0.4" H ₂ O Drop
2. Tailpipe pressure within ± 1 " H ₂ O during driving cycle with CVS and without CVS.	+0.0" -0.55"H ₂ O as measured with a 350 CID Chevelle during the first 250 seconds of the Federal cycle. The static pressure tap was located 3-1/2" from the end of the tailpipe.
3. Preheater to bring CVS within $\pm 10^{\circ}\text{F}$ of set point prior to test startup.	$\pm 2^{\circ}\text{F}$
4. A heat exchanger to maintain set point within $\pm 10^{\circ}\text{F}$ during the Federal Test cycle.	$\pm 5^{\circ}\text{F}$
5. A positive displacement pump of 300 to 350 CFM capacity calibrated per Appendix III.	Sutorbilt 5LV running at 1125 RPM, producing approximately 343 CFM. See calibration section for calibration information.
6. Temperature sensor within $\pm 2^{\circ}\text{F}$ allowing continuous recording.	$\pm 2^{\circ}\text{F}$
7. Gauge (G1) with accuracy of $\pm 3\text{mm Hg}$.	$\pm 0.2 \text{ mm Hg}$
8. Gauge (G2) with accuracy of $\pm 3\text{mm Hg}$.	$\pm 0.2 \text{ mm Hg}$
9. Sample probes (S1 and S2)	Five specially designed probes (S1, S2, continuous S1 and S2 plus raw exhaust)
10. Filters (F1 and F2)	F1 and F2
11. Pumps (P1 and P2)	Stainless steel Metal Bellows pumps (P1 and P2) plus 1 to 3 additional pumps for other purposes.
12 & 13. Flow control valves (N1 and N2) and flowmeters (FL1 and FL2) to ensure constant sample flow.	Flowmeters (FL1 and FL2) with integral valves (N1 and N2) plus, in some cases, flow control pressure regulators.
14. Three-way solenoid valves (V1 and V2)	Stainless steel Skinner 3-way valves (V1 and V2)
15. Quick connect leak tight-fittings (C1 and C2) to connect sample bags to CVS, EAC, purge cylinder and evacuation pump.	Specially designed leak-tight pneumatic system using solenoid and/or rotary valves to perform sample and bag management without any fittings or make/break operations. This facilitates rapid and accurate sample analysis.

TABLE 2.4-1

TABLE 2.4-1 (Cont.)

- | | |
|--|--|
| 16. Sample collection bags of sufficient capacity. | Four large sample bags made of Tedlar. These bags can be analyzed, evacuated, purged and re-evacuated in alternate pairs such that the 1975 procedure calling for six samples can be performed with four bags. |
| 17. A revolution counter for pump revolutions. | Two revolution counters electrically latched to the sample solenoid valves. As a backup the elapsed time of each test phase is recorded. The blower is driven by a synchronous motor such that blower RPM is constant. Thus; $N = ET(RPM)$ |

2.4.3 Exhaust Analysis Console (EAC)

The exhaust analysis consoles used during the performance of this program were designed in accordance with specifications stipulated in various Federal Registers for vehicle emissions testing by the 1972 and 1975 Federal Test Procedures. The features specified in the 1975 Federal Test Procedure for drying the sample gas and removing carbon dioxide from the carbon monoxide sample train were not included. These were not of practical importance at the higher emissions levels encountered. The instruments used in the exhaust analysis consoles were the Beckman Model 315A or 315B Nondispersive Infrared Analyzers (NDIR's) for the measurement of carbon monoxide and carbon dioxide. The carbon monoxide instrument featured a stacked sample cell configuration and three-range amplifier. The carbon dioxide analyzer contained the standard 1/8 inch sample cell with a three range amplifier. Table 2.4-2 lists the performance specifications of the AESi Exhaust Analysis Consoles.

In addition to the specifications described in Table 2.4-2, which satisfy EPA specifications, the AESi Exhaust Analysis Consoles contain the following items:

1. Ability to analyze continuous dilute and raw undilute exhaust gas and collect expelled analyzer gases for return to the AESi CVS. (Raw undilute sample is expelled into the CVS before dilution air is mixed with exhaust gases.) The obvious benefit is continuous analysis of vehicle operation which can be achieved without affecting the collection and analysis of any bag sample.
2. Three to four calibration gas inlet ports per instrument to facilitate instrument curve development and calibration results.
3. Large selection of full scale ranges available for each instrument.

A Beckman Model 400 Flame Ionization Detector (FID) was utilized to measure total hydrocarbons. Each of the Model 400 Flame Ionization Detectors was operated with a 40% hydrogen/60% nitrogen fuel mixture and special capillary to minimize the oxygen effect.

The Thermo Electron Corporation Model 10A Chemiluminescence Analyzer was used for the measurement of NO and NOx. This instrument was equipped with

AESi Exhaust Analysis Console - Performance Specifications

SPECIFICATION	AESi EAC PERFORMANCE
1. Quick-connect, leak-tight fitting (C3) to attach sample bags to analytical system.	Specially designed leak-tight system using solenoid valves to manage sample and background bag analysis without disturbing system fittings or seals.
2. Filter (F3) to remove any residual particulate matter from the collected samples.	Three filters are used: One filter for the FID instrument; one filter for the NO _x instrument; and one filter for both the CO and CO ₂ NDIR instruments.
3. Pump (P3)	Three sample pumps are used aligned in the same manner as described above for the filters.
4. Selector valves (V3, V4 and V5)	Selector valves and solenoid selector valves.
5. Flow control valves to regulate the gas flow rates.	Flow control valves and sample by-pass flow control valves.
6. Flowmeters (FL3, FL4 and FL5)	Four flowmeters, one for each instrument and sample by-pass flowmeters.
7. Manifold to collect expelled gases from each analyzer.	Manifold to collect expelled gases.
8. Pump (P4) to transfer expelled gases to a vent external to the test room (optional).	Pump not necessary. Expelled gases are vented to outlet side of the CVS positive displacement pump, which is exhausted external to the test facility.
9. Analyzers to determine hydrocarbon, carbon monoxide and oxides of nitrogen concentrations.	Analyzers to determine hydrocarbon, carbon monoxide, oxides of nitrogen and carbon dioxide concentrations.
10. An oxides of nitrogen converter to convert any NO ₂ present in the samples to NO before analysis.	An oxides of nitrogen converter to convert any NO ₂ present in the samples to NO before analysis.
11. Selector valves (V6 and V7) to allow gases to bypass the converter.	Stainless steel solenoid selector valves to manage bypass of the oxides of nitrogen converter.
12. Recorders (R1, R2 and R3).	Two Honeywell Model 193 potentiometric recorders were used in each EAC.

TABLE 2.4-2

7 ranges from 0 to 10 through 0 to 10,000 ppm NO. A thermal converter was employed to convert NO₂ and other nitrogen oxides to NO.

Honeywell Model 193 Potentiometric Recorders were used in the exhaust analysis console to record all instrument signal outputs. Table 2.4-3 indicates the ranges used for each instrument.

INSTRUMENT RANGES

<u>INSTRUMENT</u>	<u>AESi RANGE NO.</u>	<u>NOMINAL RANGE CONCENTRATIONS</u>
Hydrocarbon	2	0 - 300 ppm
	3	0 - 4,000 ppm
	4	0 - 15,000 ppm
Carbon Monoxide	1	0 - 10.0 percent
	2	0 - 6.0 percent
	3	0 - 3.0 percent
	4	0 - 1.5 percent
	6	0 - 0.5 percent
Carbon Dioxide	2	0 - 6.0 percent
	3	0 - 4.0 percent
NO and NOx	5	0 - 250 ppm
	6	0 - 1,000 ppm

TABLE 2.4-3

2.4.4 SHED and Fuel Conditioning Cart

An AESi-designed and fabricated SHED (Sealed Housing for Evaporative Determinations) was used in Los Angeles to perform the evaporative emissions portion of the test program. The SHED is constructed of preformed light gauge aluminum panels providing excellent heat dissipation. Panels were bolted together at formed flanges, and the SHED was fitted with windows, doors and a ceiling of tautly stretched Dupont Tedlar polyvinyl fluoride film. The SHED dimensions are 10 feet wide by 21 feet long by 8 feet high--large enough to accommodate all standard sized automobiles. Specially designed doors seal completely upon closing rendering the enclosure leak proof and pressure tight. Specifications for the SHED are in agreement with all requirements stipulated in the SAE J171 Evaporative Emissions Test Procedure. A Beckman Model 400 Flame Ionization Detector was used in conjunction with the SHED to measure hydrocarbon evaporative emissions.

The AESi Fuel Conditioning Cart used to condition test fuel was of the same design and manufacture as those used by the Environmental Protection Agency in the Ann Arbor facility. The fuel conditioning cart was capable of maintaining a bulk fuel temperature of 60° or less. The fuel conditioning cart had the capability of transferring fuel and filling or emptying vehicle tanks, and featured an internal fuel circulate mode to expedite gasoline temperature conditioning and to prevent temperature stratification within the tank. The cart was fabricated in accordance with National Electric Code specifications for equipment operated in hazardous atmospheres.

2.4.5 Laboratory Standard Calibration Gases

Two complete sets of laboratory standard calibration gases were procured by AESi. The contents of each cylinder were analyzed and concentrations were assigned by the Office of Air & Water Programs of the Environmental Protection Agency in Ann Arbor. Each laboratory used the standard set of gases for defining the complete instrument calibration curves and for subsequent assigning of values to the day-to-day "working" gases. The laboratory standard gases and their nominal concentrations are tabulated in Figure 2.4-1.

LABORATORY STANDARD CALIBRATION GASES

<u>Instrument</u>	<u>AESi Range</u>	<u>Nominal Concentration</u>
HC (FID)	2	29.55 ppm Carbon in Air
"	2	99.3 " " " "
"	2	200.7 " " " "
"	2-3	306.6 " " " "
"	3	585.0 " " " "
"	3	933.0 " " " "
"	3-4	1,465.5 " " " "
"	3-4	4,068.0 " " " "
"	4	8,432.0 " " " "
"	4	12,058.0 " " " "
CO (NDIR)	6	1,071 ppm CO in N ₂
"	6	2,170 " " " "
"	6-3	3,150 " " " "
"	6	4,997 " " " "
"	3	8,100 " " " "
"	2	12,800 " " " "
"	3	13,100 " " " "
"	2-1	15,900 " " " "
"	3-1	20,400 " " " "
"	2-1	39,100 " " " "
"	2-1	56,500 " " " "
"	1	91,400 " " " "
CO ₂ (NDIR)	3	6,000 ppm CO ₂ in N ₂
"	2	10,007 " " " "
"	3	14,960 " " " "
"	3	20,500 " " " "
"	2	24,800 " " " "
"	3	30,000 " " " "
"	3-2	38,200 " " " "
"	2	59,100 " " " "
NO _x (CL)	5	54 ppm NO in N ₂
"	5	100 " " " "
"	5	176 " " " "
"	5-6	196 " " " "
"	6	315.75 ppm NO in N ₂
"	6	464.25 " " " "
"	6	626.95 " " " "
"	6	784.65 " " " "

Figure 2.4-1

2.4.6 Chassis Dynamometer

A Clayton Variable Inertia Chassis Dynamometer (CE-50) equipped with 250-pound increment inertia loading weights and low torque bridge (0-50 hp) was utilized in each of the laboratories. The total absorption, torque and speed measuring systems utilized in the CE-50 provide an overall accuracy within 1.0% of full scale. AESi has added a tachometer generator driven by the front roll to the CE-50 to operate the driver's aid chart and facilitate calibration.

2.4.7 Miscellaneous Equipment

In addition to the equipment previously described, Varian driver aids were utilized to provide driving schedules for the various driving sequences performed during this program. An Autoscan ignition analyzer, timing lights, tach-dwell meter, other tuneup equipment, and small tools were used as necessary. To measure idle carbon monoxide, a Horiba Mexa 300 dual range NDIR exhaust gas analyzer was used. The nominal concentration ranges for this instrument are 0 - 10% and 0 - 2% carbon monoxide, and 0 - 400 ppm and 0 - 200 ppm hexane equivalents.

Precise weighing of propane recovery test cylinders was accomplished using a Sartorius Balance which can weigh up to 2.2 Kg with a resolution of 10 mg and an accuracy of ± 7 mg. The balance contains Class S weights which are traceable to the National Bureau of Standards. For less precise measurement, an O'Haus Scales with an accuracy of ± 50 mg was used.

Absolute pressure was measured with a Meriam Model 310EF10 Mercury Manometer incorporating a 0.01 inch of mercury vernier scale and a thermometer. Calibration is traceable to the National Bureau of Standards and is within 0.009 inch of mercury throughout the working range.

Temperature measurements were made with certified ASTM 64F or 50F thermometers or pyrometers and thermometers calibrated against the ASTM thermometers. Calibration is traceable to the National Bureau of Standards.

For calibration of the constant volume sampler, AESi used Meriam Model 50 MC2-6SF and Model 50 MC2-4SF laminar flow elements. Both of these instruments have calibration curves traceable to the National Bureau of Standards.

Moreover, these instruments have been operated in series such that total measurement differences could be observed. These differences are less than 0.5%.

Instruments used to monitor the laminar flow elements include the temperature and pressure devices listed above plus inclined manometers (Meriam Models 40GD10 and 40 HE35) for determining the pressure drop across the laminar flow element. The inclined manometers have calibrations which are traceable to the National Bureau of Standards.

2.5 EQUIPMENT QUALIFICATION, CALIBRATION AND CROSS CHECK

This section describes in detail the qualification, calibration and cross check procedures utilized by AESi and EPA technical personnel to ensure the generation of precise emissions test data. The requirements for system qualification was ± 2 percent overall accuracy. This requirement encompassed the constant volume sampler, exhaust analysis console, the primary CVS flow calibration device, and a laboratory balance. In addition the chassis dynamometer was calibrated by the coast-down technique stipulated in the Federal Register. The SHED for evaporative determination in Los Angeles was qualified and calibrated in accordance with procedures stipulated in the SAE Technical Report J171.

In addition to the initial qualifications in each of the cities, EPA personnel supervised periodic calibrations and cross check procedures in each city during the course of the program. No tests were performed in either city before meeting the qualification or cross check requirements. Throughout the course of the program, AESi maintained a schedule for daily, weekly and monthly calibration and maintenance. This procedure included one hour each morning, plus four hours each week, plus eight hours each month to perform this function.

2.5.1 Constant Volume Sampler (CVS)

AESI's CVS's were calibrated with the laminar flow elements and accessories (See Section 2.4.7.) by the basic procedure specified in the Federal Register. The latest calibration procedures from EPA-CRC-sponsored symposia were used.

In addition to measuring CVS flow at ten pressure differentials (Figure 2.5-1) using the recommended practices discussed at the Ann Arbor symposium, AESi measured flow at several points at inlet temperatures above and below the set point temperature. During flow testing all possible variables were measured and accounted for. This includes an important parameter often overlooked by others--the temperature of manometer fluid in the barometer and the inclined manometer. Blower motor speed was verified by means of a 60 Hz strobe light. The inlet and outlet pressures and temperatures were varied over ranges which

ALSTON
AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC.

CVS FLOW TEST 1 MKII 2

DESCRIPTION: ☒ INLET ☐ OUTLET

2043 W 11-13-78
2053 Site Date
2053 No.

$$V_0 = (\Delta P_L \cdot 127 + 4) \cdot f_T \cdot P_L \cdot P_R \div P_B \cdot T_P \div 596250$$

$$P_A \text{ cor } H_2O = (-0.00135 \cdot T_A^{\circ}F + 13.5912) P_A \text{ Hg}^{\circ}$$

TECH JAS

SH 1 OF 1

STEP NO.	ΔP H ₂ O"	V ₀ Ft. ³ /REV.	T _A OF	P _A Hg"	P _A cor H ₂ O"	ΔP_L H ₂ O"	T _M f T _M	T _L f T _L	$\square + P_{L \Delta H_2O}''$ ☒ - $P_{L \Delta H_2O}''$	P _B Δ H ₂ O"	P _B Δ H ₂ O"	T _P °F	T _P °R	TIME SET	READ
1.	12.6	0.3041		407.9		2.37	71.5	70.4	1.2	11.1	12.1	121	580.7	2:00	2:35
2.	14.0	0.3025		407.9		2.365	72	71.5	1.2	12.5	12.5	120.5	580.2	2:39	2:52
3.	15.9	0.3015		407.9		2.345	72	72.5	1.2	14.4	14.4	120.3	580.0	2:53	3:06
4.	17.9	0.2988		407.9		2.31	73	72.2	1.2	16.4	16.4	121.0	580.7	3:08	3:21
5.	20.2	0.3002		407.9		2.30	73.5	71.4	1.1	18.7	18.7	121.5	581.2	3:23	3:34
6.	25.0	0.2984		407.9		2.24	73.0	70.5	1.1	23.5	23.5	124	583.7	3:36	4:00
7.	30.2	0.2958		407.9		2.19	73	70.4	1.1	28.8	28.8	124	583.7	4:02	4:17
8.	35.0	0.2937		407.9		2.14	73	69.5	1.1	33.6	33.6	122	581.7	4:18	4:34
9.	40.1	0.2904		407.9		2.09	72.5	1.0000	1.0	38.8	38.8	122	581.7	4:36	4:45
10.	17.2	0.3039		407.9		2.33	72.5	69.8	1.2	15.7	15.7	121	580.7	4:47	4:55
11.	13.0	0.3068		407.9		2.39	72.5	70.8	1.2	11.5	11.5	122	581.7	4:57	5:11
12.	19.0	0.3024		407.9		2.325	73.0	71.3	1.2	17.5	17.5	122	581.7	5:13	5:26
1075/13	12.7	0.3078		407.9		2.305	73.0	99.5	1.2	390.4	390.4	581.7	5:26	5:27	5:38

Figure 2.5-1

surround and include in every dimension, the set of conditions at which the CVS is operated during emissions testing.

Before inviting EPA personnel to the test site for qualification, AESi performed ten propane recovery tests in the 0 - 300 ppm carbon range to ensure proper calibration. For inspecting EPA officers, AESi repeated propane recovery tests to EPA's satisfaction.

Since CVS calibration is critical, continuous checks had to be made. Propane recovery tests were performed in the 0 - 300 ppm carbon range before testing every day. If the test was not within $\pm 2\%$, the cause of error was determined and remedied. A propane test within $\pm 2\%$ was run before testing began.

The propane test results were plotted so that any upward or downward trend could be detected. If such a trend had developed, the CVS would have been immediately recalibrated using a laminar flow element. The CVS was also leak checked every day. Periodically the pyrometer, pressure gauges and other CVS instruments were checked for calibration regardless of need indicated by propane tests. A log book was maintained for the CVS in which all repairs, alterations, calibrations and propane tests were recorded. Moreover, files were maintained on the CVS's in which a history of blower volume and other characteristics was kept.

2.5.2 Exhaust Analysis Console (EAC)

Calibration and qualification of the Exhaust Analysis Console (EAC) was performed as stipulated in the Federal Register. Some of the procedures discussed here were performed prior to the arrival of the Project Officer. Prerequisite to qualification of the EAC was analysis of on-site laboratory gases by the Office of Air and Water Programs.

Items which were checked and verified prior to individual instrument calibration were the following: 1) total EAC leak check; 2) checked zero air quality with hydrocarbon free air; 3) adjusted all analyzers to optimize performance as specified by individual instrument manuals; 4) checked response times for all instruments. The following paragraphs describe individual analyzer optimization procedures and qualification items.

Hydrocarbon Analyzer (Beckman Model 400)

1. Obtain maximum sensitivity using the following method:
 - a. Set fuel pressure to approximately 25 psig.
 - b. Set air pressure to approximately 15 psig.
 - c. Light burner (allow 30 minutes for warmup).
 - d. Set sample pressure to approximately 4 psig.
 - e. Flow zero grade air and set zero on meter or recorder.
 - f. Flow mid-range calibration gas.
 - g. With calibration gas flowing through instrument, adjust air pressure to obtain maximum upscale reading.
 - h. Adjust sample pressure to obtain maximum reading and best response.
2. Develop instrument curves for ranges 0-300, 0-3000, and 0-15,000 ppm.
3. Verify results graphically.

Carbon Monoxide Analyzer (Beckman Model 315A or 315B)

1. Check and/or adjust instrument tuning.
2. Check and/or adjust demodulator switching pattern.
3. Check instrument response to water and 100% carbon dioxide (CO₂) on range 2.
4. Develop instrument curves for ranges described in Section 2.4.5.
5. Verify curve results graphically.

Carbon Dioxide Analyzer (Beckman Model 315A or 315B)

1. Check and/or adjust instrument tuning.
2. Check and/or adjust demodulator switching pattern.
3. Develop instrument curves for ranges described in Section 2.4.5.
4. Verify curve results graphically.

Oxides of Nitrogen Analyzer (TECo Model 10A)

1. Verify reaction chamber pressure to be in the 5-12 torr range.
2. Check response time through thermal converter versus bypass of thermal converter.
3. Develop instrument curves for ranges described in Section 2.4.5. and verify curve results graphically. (Preliminary converter efficiency check can be performed during curve development.)
4. Converter efficiency checks were performed as described in 35 Federal Register 219, November 10, 1970, Part II.

EAC daily and weekly checks which were performed and recorded are described below:

Daily Check

1. Leak check of HC, CO, CO₂ and NO instruments.
2. NO vacuum check.

3. HC analyzer - zero and span.
4. CO analyzer - zero, gain and tune.
5. CO₂ analyzer - zero, gain and tune.
6. NO analyzer gain.

Weekly Check

1. Individual instrument curve check of each range used.
2. Converter efficiency.
3. CO response to 100% wet CO₂.

Additional discussion is presented in Section 2.7.1.

2.5.3 Chassis Dynamometer

The Clayton CE-50 dynamometers were calibrated by the coast-down technique specified in Appendix II of 35 Federal Register 219, Part II. A precision tachometer generator was fitted to the absorption rolls for this purpose. AESi performed the coast-down at several power settings and at two or more inertia values. The driver's aid was adjusted to match the correct speed according to a 30 and a 60 Hz strobe light. Dynamometer calibration data was plotted graphically on a Dynamometer Road Load (DRL) form (Figure 2.5-2).

Periodic coast-down calibration checks were performed on each dynamometer. If the data points did not lie within tolerance (1% of full scale or 1/2 hp) of the standing calibration curve, the entire calibration curve set was rerun. A log book and curve file were maintained on all dynamometers.

2.5.4 Sealed Housing for Evaporative Determinations (SHED)

SAE J171 was the guiding document in the design, calibration and maintenance of the SHED. AESi developed a form, the SHED Qualification Test (SQT), Figure 2.5-3, to facilitate quality control of the SHED. The initial setup of the SHED included calibration of the pyrometers for fuel and enclosure temperatures and calibration of the Flame Ionization Detector (FID) used to determine hydrocarbon concentration within the SHED. Three ranges were utilized for FID operation: 1) 0-300 ppm; 2) 0-4000 ppm; 3) 0-15,000 ppm.

For initial calibration a background emissions check, SQT Part III, was run overnight. Then a calibration check, SQT Part I, was performed followed by the leak check, SQT Part II. Ongoing calibration maintenance consists of calibrations and leak checks conducted on a weekly basis.

AESi

Automotive Performance Systems, Inc.

SUPERVISOR

JGS

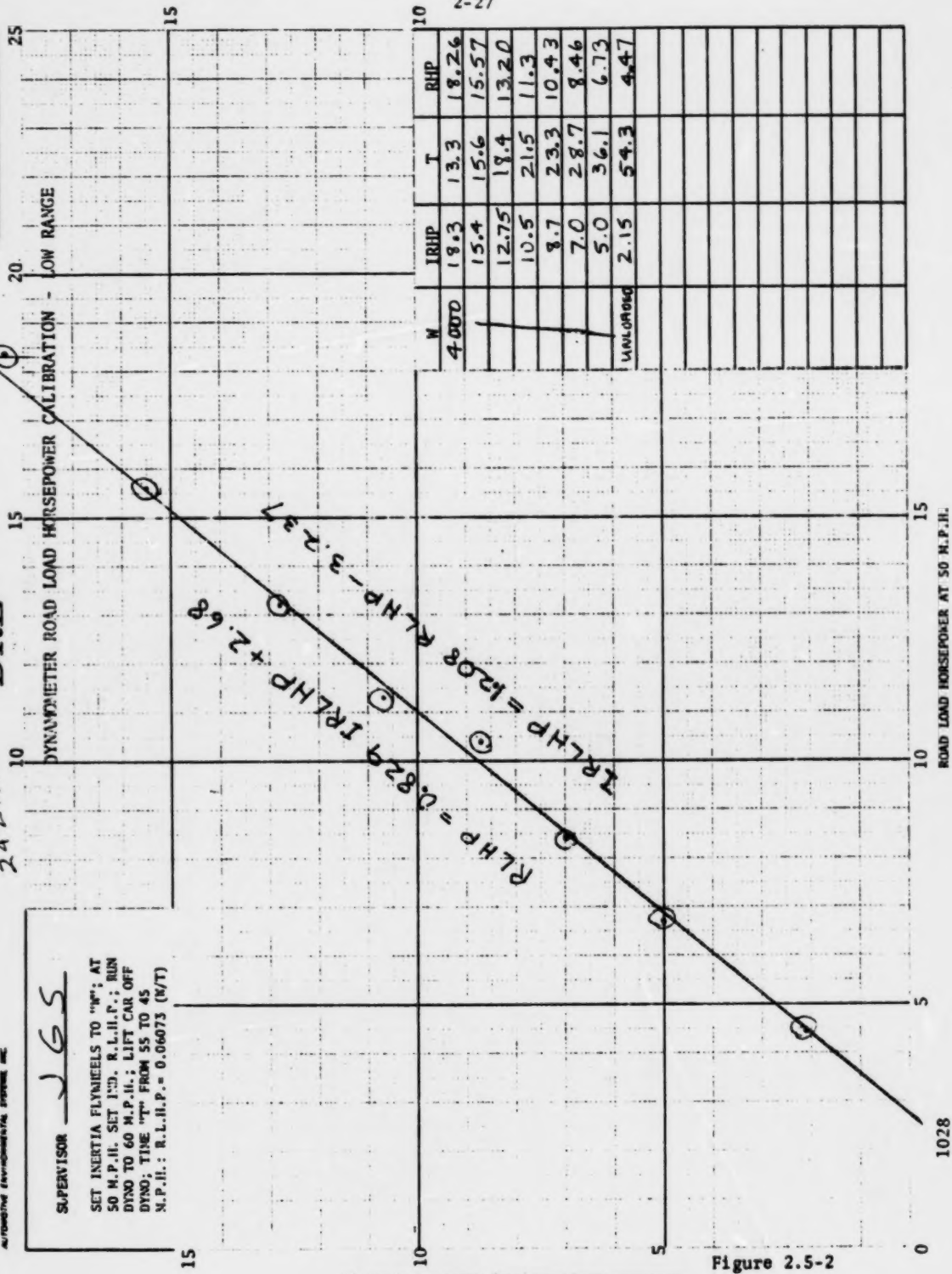
SET INERTIA FLYWHEELS TO "H": AT
50 M.P.H. SET 1ST. R.L.H.P.; RUN
DYN TO 60 M.P.H.; LIFT CAR OFF
DYN; TIME "T" FROM 55 TO 45
M.P.H.; R.L.H.P. = 0.06073 (N/T)

DRL

CE-50 DYNO

24292

2050	2043	W	2-7-73
Prj. No	Site	Date	



2-27

W	IRHP	T	RHP
4000	18.3	13.3	18.26
	15.4	15.6	15.57
	12.75	18.4	13.20
	10.5	21.5	11.3
	8.7	23.3	10.43
	7.0	28.7	8.46
	5.0	36.1	6.73
VARIOUS	2.15	54.3	4.47

Figure 2.5-2

INDICATED ROAD LOAD HORSEPOWER AT 50 M.P.H.

ROAD LOAD HORSEPOWER AT 50 M.P.H.

AESI.....

SQT

SHED QUALIFICATION TEST

TECH: 165 SHED VOLUME: 1695.3 FT.³ = V

2053	W/M	2-673
Proj. No.	Site	Date

I. CALIBRATION

- A. PURGE SHED.
- B. SEAL DOOR. $V_{SCF} = (-0.00136 \cdot T_A + 13.6912) P_A \cdot 3016 \text{ Hg} \cdot V \cdot 1.298 + T_S \cdot 28.5^\circ R$
- C. READ SHED BACKGROUND. FID 513 $\cdot \text{PPM}_{\text{BKD}}$ 263 (R21)
- D. INJECT ≈ 15 GRAMS PROPANE. CYL. FULL 565.20 CYL. AFTER 541.85 = *GP 26.35 TIME₁ 16.19
- E. OPERATE MIXING FAN 3-5 MIN. READ SHED. FID 96.3 $\cdot \text{PPM}_1$ 963 TIME₂ 10.26 (R3)
- ($\text{PPM}_1 - \text{PPM}_{\text{BKD}}$) $0.00173 \cdot V_{SCF} + \text{GP} = 166.7$ RECOVERY = 100 $\pm 5\%$? YES PASS

II. LEAK CHECK

- A. LEAVE SHED SEALED AFTER CALIBRATION. LEAVE MIXING FAN ON. DO NOT READ SHED.
- B. AFTER 4 HR. READ SHED. FID 959 $\cdot \text{PPM}_2$ 954 TIME₃ 22.0 - T₁ = * 46 E.T. HR.
- ($\text{PPM}_1 - \text{PPM}_2$) $V_{SCF} \cdot 0.0000173 + \text{E.T.} = 0.005$ g/HR. LEAKAGE ≤ 0.1 g/HR.? YES PASS

III. EMISSION CHECK

- A. PURGE SHED.
- B. SEAL SHED. TIME₄ 3.53 $\cdot V_{SCF}$ 1670.22 = (-0.00136 $\cdot T_A$ 77 $\cdot F + 13.6912$) $P_A \cdot 3016 \text{ Hg} \cdot V \cdot 1.298 + T_S \cdot 541^\circ R$
- C. READ SHED. FID 530 $\cdot \text{PPM}_3$ 530
- D. LEAVE SHED SEALED AND DO NOT SAMPLE FOR 4 HR. READ SHED.
- FID 56.8 $\cdot \text{PPM}_4$ 56.6 TIME₅ 8.27 $\cdot T_4 = 171$ E.T. HR.
- ($\text{PPM}_4 - \text{PPM}_3$) $V_{SCF} \cdot 0.0000173 + \text{E.T.} = 0.0064$ g/HR EMISSION ≤ 0.1 g/HR.? YES PASS

COMMENTS:

R2 993 PPM = 99.3 DEF

R3 933.0 PPM = 93.3 DEF

*Calculated Value. All others are observed.

Figure 2.5-3

AESi used a fuel conditioning cart of the same manufacture and type as EPA. The cart simply required calibration of the temperature sensor and adjustment of the thermostatic control system.

2.6 TEST PROCEDURES

2.6.1 Vehicle and Equipment Preparation

All vehicles tested in this program were inspected upon receipt from the vehicle owner. The inspection consisted of verification of the particular make, model year, type of engine, transmission and other information pertinent to the program. In addition, a cursory inspection was performed to determine that the vehicle was operating safely and that the exhaust system was not leaking. Also, each test vehicle was inspected for any visible damage which was pointed out to the owner and noted on the appropriate forms.

For those vehicles which were subject to evaporative emissions tests, the vehicle preparation consisted not only of the inspection upon receipt of the car from the owner, but also draining the fuel tank, installing a thermocouple through a hole drilled in the filler cap received with the car, and filling the fuel tank to 40 percent capacity with temperature conditioned fuel.

The need to test each vehicle in the as-received condition was of paramount consideration during the vehicle preparation procedures. Because of this important program need, measurements of vehicle operating parameters such as basic ignition timing, point dwell, idle speed, and idle mixture were performed on the vehicle following exhaust and evaporative emissions tests. In order to prevent any possibility of technicians upsetting any of the as-received adjustments, instruments were not attached to the test vehicles prior to the exhaust emissions test. A visual examination of the underhood area was performed in order to determine that gross malfunctions of the running gear would not occur. Also a visual examination of the exhaust system was performed in order to determine if any leaks existed.

All test equipment was thoroughly warmed up, calibrated, and inspected for proper operation prior to the performance of any tests. The chassis dynamometer was thoroughly warmed up using a non-test vehicle, if the dynamometer had not been used during the previous two hours. During the dynamometer warmup procedure, inertia and road load of the dynamometer were properly set for the following test car. In addition, the dynamometer speed indicator was calibrated and checked against the driver's aid to ensure that both speed indications were identical.

The exhaust analysis console was normally left operating during the daylight hours. All instruments were left in a standby status with either dry nitrogen or dry air continuously flowing through the instruments. Therefore, it was normally not necessary to perform any preparation on the exhaust analysis console prior to testing with the exception of the routine calibration procedures. In the event that the exhaust analysis console or any instruments were shut down for any length of time prior to testing, a minimum warmup period of one half hour was required prior to use. The NO_x instrument ozone generator was normally turned off each night. About ten minutes warmup time was provided prior to use of the NO_x instrument. Normally, however, this warmup time occurred while other instruments were being calibrated or while the vehicle was being prepared for testing.

The constant volume sampler does require approximately one-half hour warmup prior to testing to ensure precise measurements, if it had not been operated during the previous 24 hour period. If operation was performed in the last 24 hours, less warmup time was required. The CVS was equipped with controls to permit rapid heating of the heat exchanger and blower. The constant volume sampler was turned on and operated early in the morning to ensure that the temperature stabilized by the time testing was initiated for the day. The CVS was connected to the vehicle used for dynamometer warmup to warm the flexible duct and mixing plenum.

No specific preconditioning procedures were utilized for the SHED with the exception of ensuring that high background hydrocarbon levels were not present in the SHED prior to testing. The flame ionization detector utilized for SHED hydrocarbon determinations was always warmed up and calibrated prior to use.

2.6.2 Federal Exhaust Emission Testing Procedures

All cold start exhaust emissions tests were performed in accordance with the procedures stipulated in 35 Federal Register 219, Part II, Sections 85.70 and 85.87 and as amended in 36 Federal Register 55, and 36 Federal Register 128. The preconditioning procedure was performed by the vehicle owner while driving to the test facility, rather than preconditioning the vehicle in accordance with the Federal Test Procedures.

Fuel used for emissions testing at the Westminster, California, test facility was the fuel contained in the vehicle tank as received, or a supply of commercial fuel was added to "top-off" the tank as required. Since Indolene 30 grade fuel was generally marketed in the Los Angeles area during most of the time this program was being run, only Indolene 30 test fuel was used for those vehicles requiring evaporative emissions testing. Indolene 30 test fuel was used for all program test vehicles in the St. Louis laboratory.

The exhaust analysis console was essentially identical with that required for the 1972 Federal Test Procedures with the addition of a CO_2 analyzer.

Another modification to the test procedure used in the program, which differs slightly from the 1972 Federal Test Procedure was that separate sample and background bags were collected during the cold transient portion (0 - 505 seconds) as well as the cold stabilized portion (506 - 1372 seconds) of the Federal Test. The Federal procedure calls for sample collection of one sample bag and one background bag during both of these portions. The results from the cold start portion of the test, however, are presumed to be identical to the prescribed 1972 procedure because mass calculations were performed on each of the transient and stabilized portions separately.

Following the cold transient and cold stabilized portions of the test, the ten minute soak was performed as stipulated for the 1975 Federal Test Procedure. After the soak, the hot transient test and the hot stabilized test were performed using separate sample and background bags for each portion. The only difference expected in the results from the actual Federal Test Procedure and the slightly modified procedure used in this program are attributed to those differences in background emissions levels between the transient and stabilized portions of the test.

Data accumulated during the Federal Test Procedure consisted of both volumetric and mass measurements for each of the portions of the procedure, i.e., cold transient, cold stabilized, hot transient, and hot stabilized. Mass results were calculated for the cold transient and cold stabilized portions and presented as grams per vehicle mile. These results have been referred to as the 1972 Federal Test Procedure results. In addition, the 1975 Federal Test Procedure results were calculated by combining the mass values from the

cold transient, cold stabilized, and hot transient portions of the test in accordance with the weighting factors provided by the 1975 Testing Procedure. This was referred to as the 1975 Federal Test Procedure. Additional discussion relating to calculation of results by these modified procedures is found in Section 2.7 entitled "Data Handling".

2.6.3 Evaporative Emissions Test Procedure

The evaporative emissions test procedure was performed on a subsample of test vehicles in Los Angeles selected by the EPA Project Officer. The procedure used for evaporative emissions testing was that stipulated in SAE Technical Report J171 entitled "Measurement of Fuel Evaporative Emissions from Gasoline Powered Passenger Cars and Light Trucks Using the Enclosure Technique." An exception to the procedure was that the 1975 FTP was used rather than the specified 7-mode cycle, to warm up the vehicle prior to hot soak loss measurements. In accordance with the contract, the measurement of running evaporative losses was deleted.

The fuel required for evaporative emissions testing was Indolene 30 Test Fuel. The original tank fuel was removed from the test car. Prior to the diurnal loss measurements, temperature conditioned test fuel was pumped into the vehicle tank in accordance with the test procedure. The fuel filler cap which was originally provided on the test vehicle had been removed previously, drilled in the appropriate location and fitted with a fine wire thermocouple for internal fuel temperature measurement. When the cap was replaced, care was taken to ensure that the thermocouple end was immersed in the fuel. A new cap was installed before return of the vehicle to its owner.

After the vehicle tank was filled to the specified 40% volume with temperature conditioned test fuel and the filler cap installed, silicone rubber heating pads were placed around the tank below the fuel level. The heating pads were affixed by the use of tape or heavy duty permanent magnets. In accordance with the SHED procedure the temperature of the fuel was elevated at a relatively uniform rate to attain the desired temperature of 84° F in one hour.

Figure 2.6-1 depicts a Temperature Achievement Plot (TAP) which was developed

TAP

TEMPERATURE ACHIEVEMENT PLOT

00014	00026	2050	WTM	23/2/3
Sq. No.	Car No.	Proj. No.	Site	Date

TICH: *SAK*

2-34

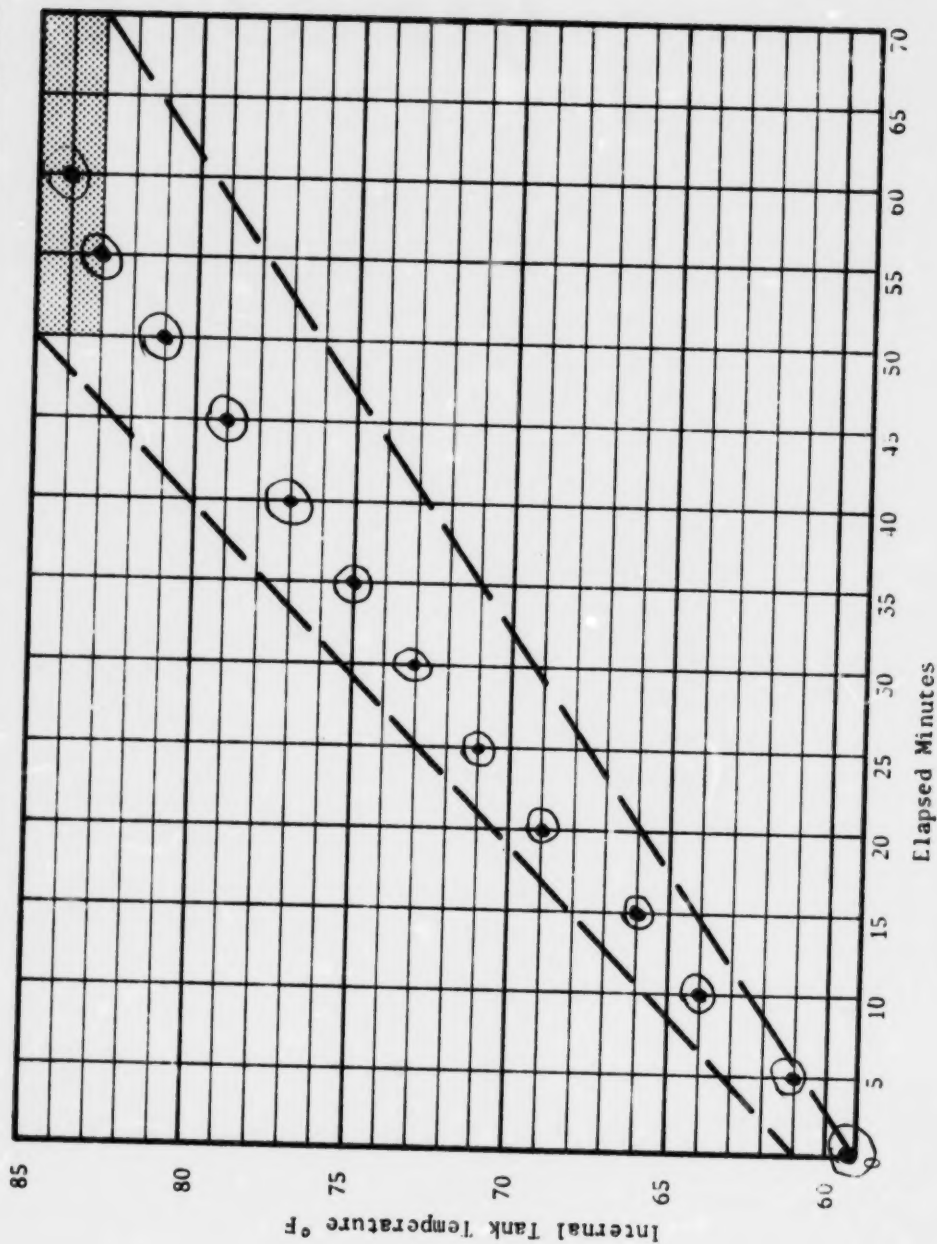


Figure 2.6-1

jointly by EPA and AESi personnel to achieve a uniform rate of heating. This temperature achievement plot was utilized for the evaporative emissions tests in the Westminster, California, facility. The use of the TAP is relatively simple and effective. During the first few minutes of the one hour diurnal soak, fuel temperatures are plotted versus time. A straight line drawn through the last two points can then be extrapolated to determine if the desired temperature and time coordinates will be achieved. The visual indication of temperature versus time enables the technician to obtain a uniform heating rate to the desired temperature by making only two or three relatively minor temperature adjustments.

Following diurnal loss measurements the test vehicle was pushed onto the chassis dynamometer. Of course, the dynamometer had previously been warmed up and adjusted to the correct inertia and horsepower. The Federal exhaust emissions test procedure was then performed. However, only the cold start, comprised of the cold transient and cold stabilized portions, the ten minute soak, and the hot start, hot transient portions were performed. In all evaporative tests the hot start, hot stabilized portions of the test were deleted. Immediately following the cold and hot start test, the vehicle was driven into the SHED and the SHED sealed for the hot soak loss measurement. During this portion of the evaporative emissions test, frequent measurement of air temperature within the SHED was required. This was because certain cars had a tendency to heat the SHED more rapidly than others and the maximum temperature of 90° could be exceeded rapidly unless cooling fans were directed against the external SHED walls.

Fuel samples were obtained using the bottom filling technique in a sealed, plated, sheet metal container. The importance of proper fuel sample handling techniques was realized and samples were carefully taken and stored in a refrigerator until fuel inspections were performed. The fuel inspections consisted of a determination of Reid vapor pressure by the ASTM method D 323, a distillation by the ASTM method D 86 including determination of temperatures at initial boiling point, final boiling point and the 5, 10, 15, 20, 30, 40, 50 and 90 percent evaporated points. In addition, a hydrogen/carbon atom ratio determination was performed on the fuel samples. Analyses were obtained through a private laboratory by the use of a chromatographic technique which identified all hydrocarbon constituents in the initial boiling point to

130°F distillation cut of the test fuel sample. Identification of the hydrocarbon peaks and of their molal concentrations was obtained. A computer program was devised to calculate the hydrogen/carbon ratio on the basis of these values. Data and procedures for calculating evaporative losses are more fully described in Section 2.7 entitled "Data Handling".

2.6.4 Daily Test Schedule

The following is a summary of the daily test schedule which was performed on those vehicles subjected to exhaust emissions tests only, at the Westminster, California, laboratory.

1. After receipt of vehicle, preparation of appropriate vehicle information forms and performance of the vehicle inspection, the vehicle was allowed to soak for the minimum 12 hour period.
2. Following the soak a Federal cold start test was performed. The cold start consisted of sample and background collections for each of the transient and cold stabilized portions.
3. A 10-minute soak with the engine off was then performed.
4. The Federal hot start test was performed and involved the collection of separate background and sample bags for each of the hot transient and hot stabilized portions.
5. Following testing, appropriate vehicle information such as basic ignition timing, point dwell, idle RPM, and idle mixture (undiluted CO) were measured and recorded.

Following is the daily test procedure used on vehicles subjected to evaporative and exhaust emissions measurements.

1. After receipt of the vehicle from the consumer and preparation of appropriate vehicle information forms, the vehicle inspection was performed. The vehicle was then readied for the 12 hour (minimum) soak.
2. The fuel remaining in the vehicle fuel tank as received was drained from the test vehicle. Concurrently, the fuel filler cap was modified to accept the thermocouple for measurement of internal fuel temperature.

3. Following the minimum 12-hour soak, the temperature conditioned fuel was pumped into the fuel tank. During the soak, thermocouples were connected and the silicone rubber heating pads were installed on the fuel tank. The temperature of the fuel was increased in accordance with the prescribed procedures. The diurnal loss test was then performed for 60 minutes.
4. The Federal cold start exhaust emissions test was performed within 15 minutes after removal of the test vehicle from the SHED.
5. The Federal cold start procedure was performed utilizing separate sample and background bags for each of the cold transient and cold stabilized portions.
6. Following the cold start, the normal 10-minute soak with engine off was performed.
7. The hot transient portion of the Federal hot start test was then performed using the bag collection technique.
8. Immediately following the hot transient portion, the vehicle was removed from the dynamometer and driven into the SHED at as low an engine load as possible. The time allowed for removal of vehicle from dyno to engine shutoff in SHED was about one minute.
9. Thermocouple wires were connected to display devices. The SHED was then sealed and the hot soak losses were measured. The time allocated for hot soak losses was one hour.
10. Following testing, appropriate vehicle information such as basic ignition timing, idle RPM, idle mixture (undiluted CO) and point dwell were measured and recorded.

The following is a summary of the daily test schedule for vehicles at the St. Louis laboratory.

1. After receipt of vehicle, preparation of appropriate vehicle information forms and performance of the vehicle inspection, the fuel tank was drained and Indolene 30 Test Fuel was added to 40 percent tank capacity. The first 505 seconds of the Federal Test Procedure were driven on the chassis dynamometer to precondition the vehicle's fuel system. Following this preconditioning, the vehicle was soaked for the minimum 12-hour period.
2. Following the soak, a Federal cold start test was performed. The cold start consisted of sample and background collections for each of the transient and cold stabilized portions.
3. A 10-minute soak with the engine off was then performed.

4. The Federal hot start test was performed and involved the collection of separate background and sample bags for each of the hot transient and hot stabilized portions.

5. Following testing, appropriate vehicle information such as basic spark timing, spark advance, point dwell, idle RPM and idle mixture (undiluted CO) were measured and recorded.

2.7 DATA HANDLING

2.7.1 Data Collection

AESi developed several test data forms for use in this program. A Test Data Sheet form was developed for the program as shown in Figure 2.7-1. This particular form is arranged in keypunch format. Evaporative emissions were measured in general accordance with the Sealed Housing for Evaporative Determinations (SHED) Technique outlined in SAE Technical Report J171, September, 1970. The data form used is shown in Figure 2.7-2.

In order to ensure first quality data, several other forms were used for total system quality. Figure 2.7-3 is an example of a Daily Instrument and CVS System Check form. In conjunction with the Daily Check form is the CVS Propane Recovery form shown in Figure 2.7-4. A Weekly Check form, Figure 2.7-5, was designed to ensure that each instrument curve is within limits of the curve originally developed. The Weekly Check was also used as the Monthly Curve Inspection form. This form also provides for an NO_x converter check, a 100% wet CO₂ response check of the CO instrument and calibration curve update information. AESi facilities also used a seven day ambient weather station, but as an additional check, a Daily Ambient Plot was still maintained in each laboratory as a permanent record. Figure 2.7-6 is an example of the weekly weather station chart and Figure 2.7-7 is an example of a Daily Ambient Plot (DAP).

For verification of valid instrument curve development, AESi used a Calibration Curve Result form (Figure 2.7-8). The use of this form allowed AESi the flexibility to accept or reject instrument curve data before entry into the computer. Instrument curves were developed on the Tymshare terminal computer and were generated by either one of two methods. The curves for all instrument ranges, with the exception of the 0-10% range for carbon monoxide (CO), were generated using a second order polynomial method of least squares equation. The curves for the 0-10% carbon monoxide (CO) range were generated by LaGrangian interpolation.

AESi used the data accumulation system at each test site that allowed for near instantaneous review of data for a particular test vehicle. Following verification of vehicle acceptability, AESi used a packet of file folders containing all data pertaining to the total testing and inspection

AESI

AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC.

TEST DATA SHEET

PRJ NO.	CAR NO.	RUN NO.	DATE	TIME	YR	MAKE	MODEL	VTP
01	02050	00001	021273	1205	70	FORD	MAVERICK	00
CID	BBL TRN	INRT	CURB WT	GVW		RDHP	DB	WB
00	250	10	2750	2411	2661	9.9	80.0	63.0
BARO	CYL A/C	EVP	EXH PCV					
3008	6	0	3	1	1			
ODOMR	FLC	FX	FV	HUCF	PIC	TEC	DRI	TVP
26724	20.0	3	0	.93	29M	2WK	2AS	0
IRPM	D-N	DWEL						
500	0	+11.0						
IGNT	A	RPM	TTAD	MECA				
03								
HC	CO	CO ₂	NO					
70								

2-40

Figure 2: COLD TRANSIENT:

1	1	1	1
2	2	2	2
3	3	3	3

HC	CO	CO ₂	NO	NO _x	NO ₂
R	DEF.	R	DEF.	R	DEF.
3	10.63	10.33	38.15	91.05	58.7
83	0.63	0.53	2.45	0.25	0.1
TEMP	PRESS	COUNT	DELTA	P	MPH
119	11.7	9476	14.5		

COLD STABILIZED:

1	2	1	4
2	2	2	2
3	3	3	3

HC	CO	CO ₂	NO	NO _x	NO ₂
R	DEF.	R	DEF.	R	DEF.
3	6.33	10.43	23.25	35.15	26.5
83	0.63	0.73	2.25	0.45	0.1
TEMP	PRESS	COUNT	DELTA	P	MPH
119	11.8	16233	14.5		

HOT TRANSIENT:

1	5	1	6
2	2	2	2
3	3	3	3

HC	CO	CO ₂	NO	NO _x	NO ₂
R	DEF.	R	DEF.	R	DEF.
2	82.43	9.83	33.55	79.15	55.2
82	5.43	0.63	2.35	0.45	0.2
TEMP	PRESS	COUNT	DELTA	P	MPH
119	11.7	9528	14.5		

HOT STABILIZED:

1	7	1	8
2	2	2	2
3	3	3	3

HC	CO	CO ₂	NO	NO _x	NO ₂
R	DEF.	R	DEF.	R	DEF.
2	85.73	10.83	22.25	30.65	26.0
82	7.53	0.53	2.45	0.35	0.2
TEMP	PRESS	COUNT	DELTA	P	MPH
119	11.7	16243			

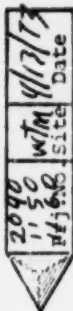
EVAPORATIVE TEST SHED RESULTS

Time	Pa 30.20 "Hg, Diurnal, D			
	Enclo. Temp, Te	Int. Tank Temp	Ext. Tank Temp	FID, Defl. ppm ₁
BKG.	81°			6.5
Initial	78°	59°		21.3
5 min.	79°	61°		41.0
10	79°	64°		59.4
15	79°	66°		81.5
20	79°	69°		7.3
25	79°	71°		8.4
30	79°	73°		10.2
35	79°	75°		11.5
40	79°	77°		13.4
45	79°	79°		14.7
50	79°	81°		16.5
55	80°	83°		18.1
60	80°	84°		19.2
65				
70				

Pa 30.21 "Hg, Hot Soak, H			
Enclos. Temp, Te	Int. Tank Temp	Ext. Tank Temp	FID Defl. ppm ₂
82°			3.2
83°	87°		14.0
87°	87°		27.0
88°	87°		42.7
88°	87°		163.0
88°	86°		79.8
88°	87°		89.5
88°	87°		8.0
88°	87°		9.0
87°	87°		9.9
87°	87°		10.8
87°	87°		11.6
86°	87°		12.2
86°	87°		13.5

Figure 2.7-2

IBP 87 : RVP, psi 9.7 : H/C Ratio 2.45 : Type Fuel Used I-30
 (12 + H/C Ratio) 0.03422 • (ppm₁ 20.400 - BKG 2)
 Pa 87 : Te 84° : R = HC Mass 14.30 grams, D
 (12 + H/C ratio) 0.03422 • (ppm₂ 14.30 - BKG 2)
 Pa 87 : Te 87° : R = HC mass 14.30 grams, H



2090
11/30
Wm Site
Date

DAILY CVS & EAC

DATE	LEAK CHECK				VAC CHECK		EID		CO		CO ₂		SHED EID		EID PRESSURE		SHED EID PRESS		PIC
	HC	CO	CO ₂	NO	NO	NO _x	ZERO	GAIN	ZERO	GAIN	ZERO	GAIN	ZERO	GAIN	SMPL	FUEL	SMPL	FUEL	
4/17/70	0.0	0.0	0.0	0.0	0.0	9.8	822	513	448	157	598	106	542	573	2.5	2.5	13	2.5	13
4/17/70	0.0	0.0	0.0	0.0	0.0	9.8	801	519	460	159	598	103	542	581	2.5	2.5	13	2.5	13
4/17/70	0.0	0.0	0.0	0.0	0.0	9.8	803	517	461	159	598	107	542	582	2.5	2.5	13	2.5	13
4/17/70	0.0	0.0	0.0	0.0	0.0	9.8	800	511	465	160	598	107	542	582	2.5	2.5	13	2.5	13
4/17/70	0.0	0.0	0.0	0.0	0.0	9.8	802	512	463	158	598	100	542	583	2.5	2.5	13	2.5	13
4/20/70	0.0	0.0	0.0	0.0	0.0	9.8	801	512	465	161	598	106	542	583	2.5	2.5	13	2.5	13

DAILY EAC

Figure 2.7-3

2-42

DATE	LEAK CHECK								BKTD BAG				SMPL EAG				PROPANE TEST				PIC
	R1	R2	S1	S2	S3	S4	CONT	DEF	DEF	DEF	DEF	DEF	DEF	DEF	DEF	DEF	DEF	DEF	DEF	DEF	
4/17/70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	166
4/17/70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	163
4/17/70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	183
4/17/70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	183
4/17/70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	177
4/20/70	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	168

DAILY CVS

MAINTENANCE:

AESI...
AUTOMOTIVE ENVIRONMENTAL SYSTEMS, INC.

PRT

CVS PROPANE RECOVERY TEST NO. 8

2050	W/M	2/12/77
Proj. No.	Site	Date

TECH: _____
E.T.: 10.00
 Δ P: 14.5

FID DEFLECTIONS	PPM _C
S1 <u>82.3</u>	<u>252.5</u>
B1 <u>5.4</u>	<u>16.6</u>

$$\begin{aligned}
 & (-0.00136 \bullet T_A \underline{77}^{\circ}\text{F} + 13.6912) \bullet P_A \underline{28.07}^{\text{mmHg}} \\
 & -P_p \underline{12.0}^{\text{mmHg}} \bullet T_p \underline{580}^{\circ}\text{R} \bullet 2.2454 \bullet \text{NET } \underline{233.9}^{\text{PPM}_C} \\
 & \bullet V_o \underline{2066}^{\text{Ft.}^3/\text{Rev.}} \bullet 0.00001 \bullet N \underline{11249} = \text{HC MASS } \underline{12.49}^{\text{GRAMS}}
 \end{aligned}$$

+ PROPANE CYLINDER EMPTY 953.25
- PROPANE CYLINDER FULL 965.85 • 100 + HC MASS = -0.88 ERROR

☐ + GAIN
☒ - LOSS

Comments: _____

Figure 2.7-4

[illegible]

19	Sq. No.	2090	Prj. No.	WJM	Site
----	---------	------	----------	-----	------

WEEKLY CHECK

INST	AESI RANGE	SPAN		MID RANGE		MID RANGE		MID RANGE		MID RANGE		MID RANGE		P.I.C	
		CONC.	DEF.	CONC.	DEF.	CONC.	DEF.	CONC.	DEF.	CONC.	DEF.	CONC.	DEF.	ZERO	DEF.
FID	2	10	3066	100.0	200.7	64.1	29.5	8.9							RWD
	3	100	4068	100.0	1463.5	35.6	93.3	22.9	3066	7.0					
	4	1000	12038	800	9066	26.6	1463.5	9.5							
CO	1	1-II	9.14	9.10	391	55.8	1.59	27.9							RWD
	2	2-II													
	3	3-II	2.04	83.0	.81	37.1	3150	15.7							
	4	1-L													
	5	2-L													
	6	3-L	4947	99.0	2170	51.0	1071	29.0							
CO2	1	1													RWD
	2	2													
	3	3	3.82	9.50	2.05	56.5	6000	19.4							
NO- NOx	4	100													RWD
	5	250	196.0	805	1000	40.8	540	22.1							
	6	1000	784.6	800	464.2	47.9	196	20.4							

CONVERTER CHECK			
	DEF. START	DEF. END	TIME E.T.
NO	11.4	9.8	10.00
NO _Y	247	248	10.00

SHED LEAK CHECK			
DEF. START	DEF. END	TIME E.T.	
			FID

CO	3.0	100% CO ₂ DEF.	WET 100% CO ₂
----	-----	---------------------------	--------------------------

code 6

MASTER CURVE
EFF RUN #

Figure 2.7-5

Reproduced from
best available copy.

2-45

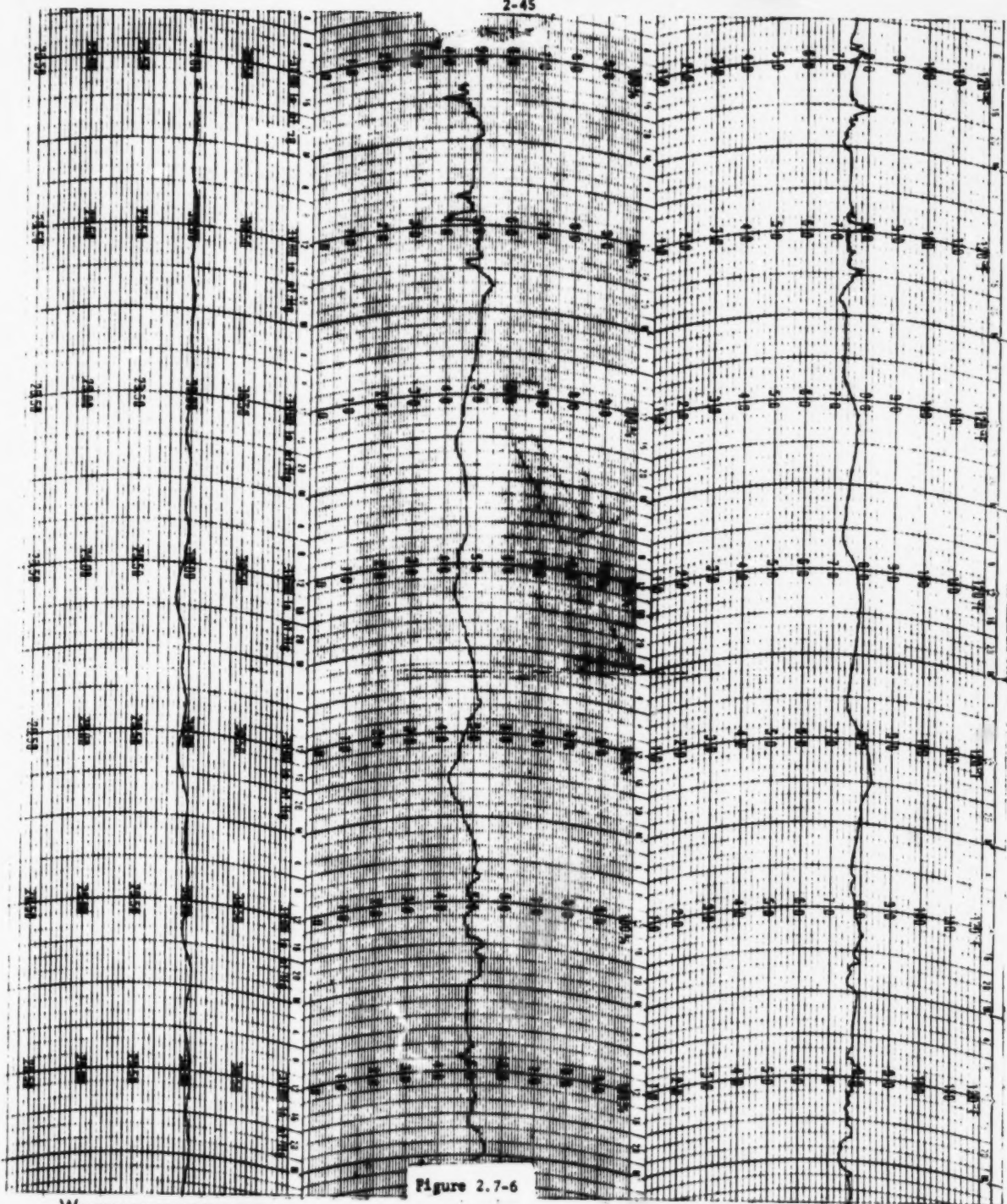


Figure 2.7-6

WEATHER MEASURE CORPORATION
P.O. BOX 41597, SACRAMENTO, CALIFORNIA 95841
TELEPHONE (916) 681-7580

METEOROGRAPH

CHART #1 701 W H 3 M

STATION WESTMINSTER, CALIF

DATE ON 24/007/73

DATE OFF 05/31/73

DAP

Daily Ambient Plot

2050	Wm	6/3/73
Prj. No.	Site	Date

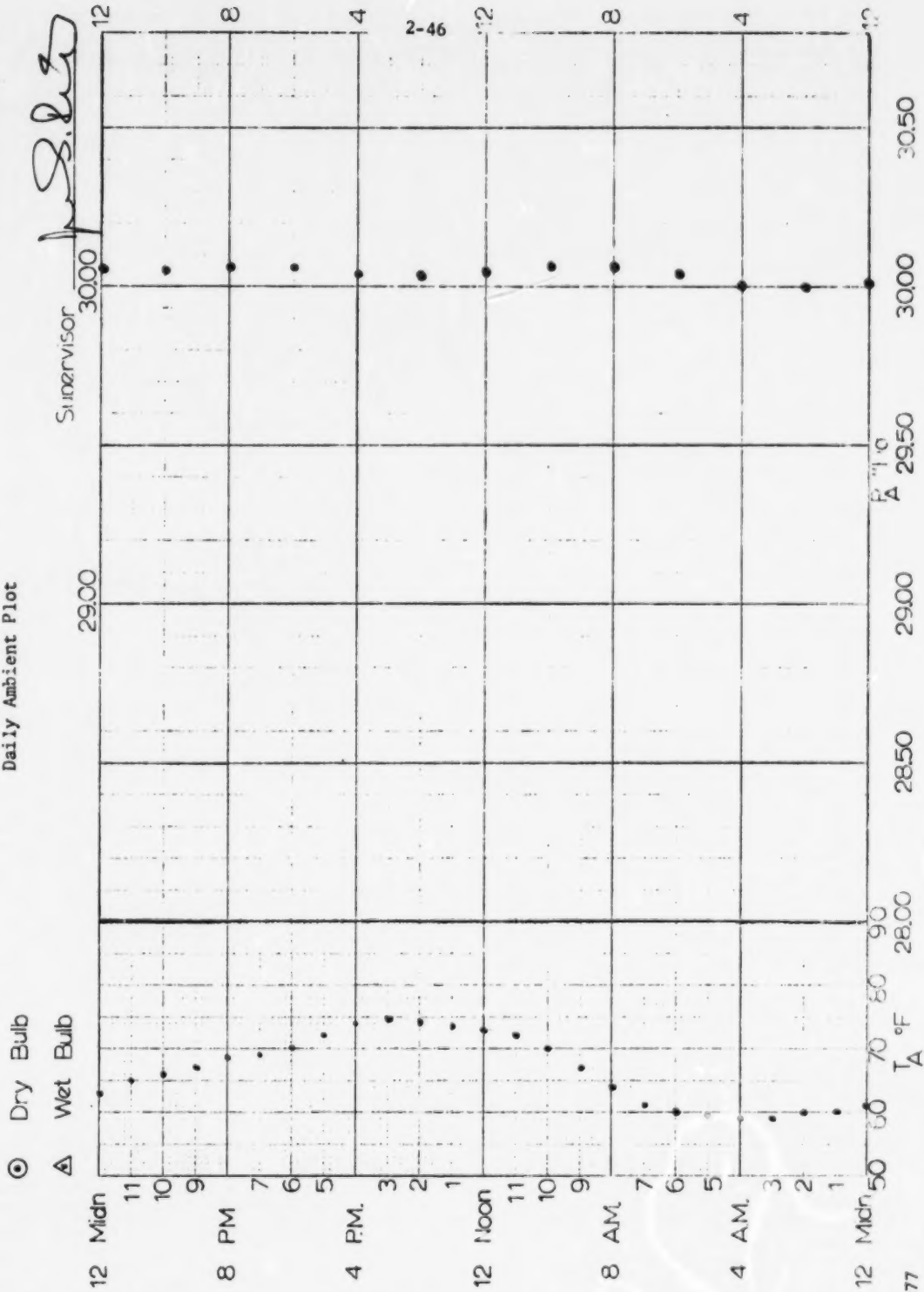


Figure 2.7-7

procedures for each test vehicle. This packet contained the following items:

1. Selected Vehicle Owner Contact form.
2. Program Log Sheet (Figure 2.7-9).
3. Test Data Sheet form which contains results of all test data.

A copy of this material was filed at the test site and the original sent to the AESi corporate office for data processing and filing. Also, a separate common file for tests conducted during a certain period of time was inserted in the on-site file and also at the AESi corporate office file. An example of items contained in the common file are listed below:

1. CVS Flow Calibration.
2. NO_x Converter Check Verification.
3. Dynamometer coast-down calibration.
4. Dynamometer speedometer and horsepower calibration.
5. Weekly Laboratory Status Report.
6. Copy of Weekly Check form.
7. Weather Station Chart or Daily Ambient Plot.
8. Instrument Curves.
9. Daily Instrument and CVS Check form.
10. CVS Propane Recovery form.

2.7.2 Data Processing

Vehicle information, results of vehicle inspection and emissions test data as recorded on the Test Data Sheet were then forwarded to the Computer Sciences Department. This sheet included all required vehicle information such as the Federal vehicle identification number, test description, cubic inch displacement, number of carburetor venturis, type of transmission and inertia weight. Also included were certain inspection and maintenance data. Exhaust emissions data were recorded in the form of instrument range and deflections for HC, CO, CO₂, NO_x and NO concentrations in the sample and background bags. Evaporative emissions test results for all instruments were also forwarded to the Computer Sciences Department to be used in translating test deflections to concentrations.

2.7.3 Calculations of Results

2.7.3.1 Exhaust Emissions: Results from the various test procedures performed during the program were calculated using well known techniques. The method for obtaining mass emissions, on a grams per mile basis, as specified in the 1972 and 1975 Federal Test Procedures, was generally used.

AESI ANALYTICAL ENVIRONMENTAL SERVICES, INC.

CAC#0001

PROGRAM LOG SHEET
Project 2050

ST. 10161531
LIC. NO.

SERIAL NO. 1019111412171610121111

	Pass	Fail	Initial
Inspect vehicle for compliance	(✓)	()	<u>JK</u>
Test car release form			<u>JK</u>
Rental car release form			<u>JK</u>
Drain fuel			<u>NAJB</u>
Fill tank to 40% capacity, Indolene 30 test fuel			<u>NAJB</u>
Precondition car for ten minutes LA4 test			<u>NAJB</u>
Perform 12 hour soak	(✓)	()	<u>JK</u>
Run cold start LA4 test	(✓)	()	<u>JK</u>
Soak for 10 minutes	(✓)	()	<u>JK</u>
Run hot start LA4 test	(✓)	()	<u>JK</u>

	Pass	Fail	Initial
Measure and record tuneup information			
Ignition timing			<u>1108TDC</u>
Dwell			<u>59°</u>
Idle RPM			<u>Dr 500 rpm</u>
Idle mixture (% CO)			<u>79% CO</u>
Review test data	(✓)	()	<u>JK</u>
Determine if replicate test is required	()	(✓)	<u>JK</u>
Inspect vehicle for damage	()	()	<u>JK</u>
Wipe car clean as necessary			<u>JK</u>
Return car to owner			<u>JK</u>
Owner signature for acceptance of vehicle			<u>JK</u>
Fill out Bond form \$25			<u>JK</u>
Bond sent to owner			<u>JK</u>

2-49

Figure 2.7-9

I hereby certify that the above items have been completed to the best of my knowledge.

Laboratory Supervisor Logan Marshall Date 2/13/73

Send test data forms to AESi and retain copy for test site files.

Emissions test results by test location are presented in Tables 1 - 10. The basic exhaust emissions results (in grams per mile) versus the various parameters are shown below:

Table No.

1A, 1B	Vehicle Make
2A, 2B	Vehicle Manufacturer
3A, 3B	Model Year
4A, 4B	Number of Cylinders
5A, 5B	Displacement
6A, 6B	Inertia Weight
7A, 7B	Transmission Type
8A, 8B	Carburetion
9A, 9B	Results of Replicate Tests
10A	Number of Vehicles Meeting 1972 Standards

These results are shown by test site and test procedure (e.g. 1A is for 1972 Federal Test Procedure and 1B is for the 1975 Federal Test Procedure).

2.7.3.2 Evaporative Emissions: The weighted average hydrogen/carbon (HC) atom ratio of the initial boiling point to 130°F vapor fraction of the test fuel was determined by use of a chromatographic technique*. A squalene column was used to produce thirty-three chromatographic peaks. Using data from a paper by Maynard and Sanders, and a known sample of natural gas, the eluted peaks were identified and the mole percents determined. The H/C ratios were calculated from the respective chemical compositions.

The following formula was used to compute the weighted average H/C ratio for each vapor sample.

$$\text{Fuel H/C ratio} = \frac{\sum_{i=1}^{33} (x_i \cdot \text{H/C}_i)}{100}$$

where x_i represents the mole percent of each individual fuel component and H/C_i represents the H/C ratio of each individual component. Evaporative emissions were calculated in accordance with SHED procedure (SAE J171). Summary results of evaporative emissions tests are highlighted in Table 11. Individual evaporative emissions test results are presented in Table 14 of the Appendix.

*J.B. Maynard and W.N. Sanders, "Determination of the Detailed HC Composition and Potential Atmospheric Reactivity of Full-Range Motor Gasolines." Shell Oil Company, Journal of the Air Pollution Control Association, July, 1969.

TABLE 1A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. VEHICLE MAKE

LOS ANGELES

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AMC	5	3.42	1.2	53.95	27.8	503.41	71.0	4.30	1.5
BUICK	12	5.82	6.2	76.95	40.4	687.56	140.7	3.99	1.8
CADILLAC	4	2.12	1.3	50.50	18.4	929.21	235.7	5.68	1.3
CHEVROLET	39	6.70	6.5	74.61	41.1	593.76	119.5	3.80	1.2
CHRYSLER	4	9.07	4.0	139.15	47.7	605.21	59.0	4.46	1.6
DATSUN	2	4.23	1.7	37.18	14.4	351.85	94.2	3.07	0.2
DODGE	10	6.02	4.7	99.01	42.0	563.31	90.4	3.85	1.4
FORD	35	4.88	2.3	69.40	32.8	563.53	136.4	4.37	2.0
LINCOLN	1	4.15	0.0	68.86	0.0	776.35	0.0	5.86	0.0
MERCURY	7	8.03	6.0	96.61	34.3	683.38	108.9	4.22	2.0
OLDSMOBILE	11	4.40	2.1	69.50	25.2	685.78	135.6	4.60	1.2
OPEL	1	7.11	0.0	71.92	0.0	338.67	0.0	5.19	0.0
PLYMOUTH	12	5.48	1.6	97.47	38.3	527.65	120.1	3.87	1.8
PONTIAC	14	6.91	8.8	74.15	20.7	672.02	81.5	4.75	1.6
TOYOTA	3	3.42	0.9	60.18	31.5	360.99	15.4	4.05	0.9
VOLKSWAGEN	10	10.60	15.3	75.80	46.5	307.00	80.4	2.55	1.1
ALL VEHICLES	170	6.04	6.2	76.96	37.9	585.04	160.4	4.10	1.6

TABLE 1A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS.

VEHICLE MAKE

ST. LOUIS

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AMC	5	4.35	3.0	51.86	48.0	379.80	72.1	3.83	2.4
BUICK	12	5.50	3.1	96.63	59.2	636.94	157.6	4.39	2.0
CADILLAC	4	5.07	4.2	96.42	91.0	800.82	171.8	4.02	2.2
CHEVROLET	39	7.04	4.6	81.06	55.4	545.93	135.4	3.73	1.4
CHRYSLER	4	10.18	7.7	113.89	75.2	497.08	116.4	3.57	1.9
DATSUN	2	5.21	3.2	74.60	46.0	290.18	36.6	2.32	0.8
DODGE	10	9.53	9.9	77.49	61.7	508.35	110.5	4.45	2.2
FORD	35	4.65	1.3	60.20	30.3	540.73	128.1	4.71	1.9
LINCOLN	1	4.13	0.0	54.37	0.0	730.88	0.0	7.37	0.0
MERCURY	7	5.83	2.2	60.93	56.0	594.90	101.5	4.03	1.3
OLDSMOBILE	11	5.19	2.1	74.68	37.6	658.29	56.6	5.14	1.5
OPEL	1	3.07	0.0	45.28	0.0	323.91	0.0	4.19	0.0
PLYMOUTH	12	5.70	3.3	64.89	39.7	528.92	70.3	4.92	2.0
PONTIAC	14	7.69	4.6	84.48	50.4	617.64	107.6	4.24	1.6
TOYOTA	3	5.18	3.7	48.94	34.5	336.35	54.9	3.35	0.8
VOLKSWAGEN	10	6.33	7.5	49.31	29.2	307.31	39.4	2.77	1.8
ALL VEHICLES	170	6.19	4.6	72.95	49.0	542.06	149.4	4.20	1.8

TABLE 1B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS.

VEHICLE MAKE

LOS ANGELES

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AMC	5	3.29	1.3	48.59	26.0	488.88	68.6	4.23	1.5
BUICK	12	5.03	5.6	64.70	37.7	663.42	132.0	3.99	1.8
CADILLAC	4	1.90	1.1	38.89	14.5	882.65	214.1	5.76	1.5
CHEVROLET	39	5.87	6.1	63.04	39.3	575.09	115.7	3.79	1.3
CHRYSLER	4	7.32	2.7	116.06	29.4	597.65	59.9	4.64	1.3
DATSUN	2	3.40	1.3	32.56	10.7	342.42	94.9	3.14	0.3
DODGE	10	5.23	4.1	82.12	40.2	546.25	87.6	3.99	1.5
FORD	35	4.27	1.9	59.89	30.1	546.02	130.8	4.35	1.9
LINCOLN	1	3.57	0.0	60.76	0.0	762.12	0.0	5.87	0.0
MERCURY	7	7.58	6.7	81.62	36.9	662.48	106.6	4.38	2.2
OLDSMOBILE	11	3.85	1.9	58.86	25.4	660.79	131.7	4.59	1.1
OPEL	1	6.03	0.0	59.77	0.0	371.06	0.0	5.52	0.0
PLYMOUTH	12	4.77	1.3	85.42	36.6	513.51	115.8	3.98	1.9
PONTIAC	14	6.03	7.9	62.80	19.8	645.49	79.9	4.78	1.4
TOYOTA	3	2.90	0.8	52.84	28.5	350.42	10.1	3.93	0.9
VOLKSWAGEN	10	10.61	16.0	72.91	48.8	302.02	78.5	2.44	1.1
ALL VEHICLES	170	5.37	6.0	65.95	35.4	566.60	152.4	4.12	1.6

TABLE 1B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS.

VEHICLE MAKE

ST. LOUIS

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AMC	5	3.91	2.8	46.70	46.7	371.26	73.7	3.87	2.4
BUICK	12	4.60	2.1	78.44	51.5	626.13	146.0	4.70	2.0
CADILLAC	4	4.29	4.3	76.48	98.4	771.93	165.3	4.22	2.5
CHEVROLET	39	6.20	4.2	65.12	46.6	527.13	129.9	3.82	1.4
CHRYSLER	4	8.73	6.9	85.91	67.2	492.57	118.7	4.02	2.0
DATSUN	2	4.03	2.5	52.66	30.8	287.17	25.6	2.86	0.1
DODGE	10	8.45	9.3	65.09	56.5	482.21	88.6	4.68	2.2
FORD	35	4.11	1.1	47.69	28.4	527.32	123.4	4.81	2.0
LINCOLN	1	3.69	0.0	29.17	0.0	703.61	0.0	7.93	0.0
MERCURY	7	5.37	2.2	53.04	49.1	577.65	92.9	4.16	1.3
OLDSMOBILE	11	4.48	1.8	59.39	31.1	637.75	51.6	5.11	1.5
OPEL	1	2.55	0.0	29.44	0.0	311.59	0.0	4.26	0.0
PLYMOUTH	12	4.89	2.6	49.53	30.3	517.56	66.4	5.15	1.9
PONTIAC	14	6.66	3.1	70.94	41.8	596.28	105.4	4.37	1.7
TOYOTA	3	4.54	3.7	42.35	33.9	328.34	54.1	3.30	0.8
VOLKSWAGEN	10	5.20	5.2	48.03	31.5	300.74	36.0	2.66	1.8
ALL VEHICLES	170	5.39	3.9	59.22	42.9	526.25	142.8	4.33	1.9

TABLE 2A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
 VS. VEHICLE MANUFACTURER
 LOS ANGELES
 1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AMC	5	3.42	1.2	53.95	27.8	503.41	71.0	4.30	1.5
CHRYSLER	26	6.24	3.5	104.48	42.2	553.30	102.4	3.95	1.6
FORD	43	5.38	3.3	73.82	33.8	587.99	140.1	4.38	2.0
GM	81	6.07	6.4	72.96	34.9	647.09	148.6	4.21	1.4
NISSAN	2	4.23	1.7	37.18	14.4	351.85	94.2	3.07	0.2
TOYOTA	3	3.42	0.9	60.18	31.5	360.99	15.4	4.05	0.9
VOLKSWAGEN	10	10.60	15.3	75.80	46.5	307.00	80.4	2.55	1.1
ALL VEHICLES	170	6.04	6.2	76.96	37.9	585.04	160.4	4.10	1.6

TABLE 2A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
 VS. VEHICLE MANUFACTURER
 ST. LOUIS

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AMC	5	4.35	3.0	51.86	48.0	379.80	72.1	3.83	2.4
CHRYSLER	26	7.86	7.2	77.27	55.1	516.11	91.4	4.54	2.0
FORD	43	4.83	1.5	60.19	34.5	553.97	126.2	4.66	1.9
GM	81	6.53	4.1	83.41	53.9	596.91	143.6	4.13	1.6
NISSAN	2	5.21	3.2	74.60	46.0	290.18	36.6	2.32	0.8
TOYOTA	3	5.18	3.7	48.94	34.5	336.35	54.9	3.35	0.8
VOLKSWAGEN	10	6.33	7.5	49.31	29.2	307.31	39.4	2.77	1.8
ALL VEHICLES	170	6.19	4.6	72.95	49.0	542.06	149.4	4.20	1.8

TABLE 2B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. VEHICLE MANUFACTURER

LOS ANGELES

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AMC	5	3.29	1.3	48.59	26.0	488.88	68.6	4.23	1.5
CHRYSLER	26	5.34	2.9	88.86	37.6	539.05	99.9	4.09	1.6
FORD	43	4.79	3.3	63.45	31.5	570.00	135.1	4.39	2.0
GM	81	5.30	5.8	61.44	33.3	624.65	139.6	4.22	1.5
NISSAN	2	3.40	1.3	32.56	10.7	342.42	94.9	3.14	0.3
TOYOTA	3	2.90	0.8	52.84	28.5	350.42	10.1	3.93	0.9
VOLKSWAGEN	10	10.61	16.0	72.91	48.8	302.02	78.5	2.44	1.1
ALL VEHICLES	170	5.37	6.0	65.95	35.4	566.60	152.4	4.12	1.6

TABLE 2B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. VEHICLE MANUFACTURER

ST. LOUIS

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AMC	5	3.91	2.8	46.70	46.7	371.26	73.7	3.87	2.4
CHRYSLER	26	6.85	6.6	61.11	47.6	500.12	82.1	4.79	2.0
FORD	43	4.30	1.4	48.13	31.8	539.61	120.7	4.78	1.9
GM	81	5.67	3.5	67.44	47.1	578.20	138.0	4.25	1.6
NISSAN	2	4.03	2.5	52.66	30.8	287.17	25.6	2.86	0.1
TOYOTA	3	4.54	3.7	42.35	33.9	328.34	54.1	3.30	0.8
VOLKSWAGEN	10	5.20	5.2	48.03	31.5	300.74	36.0	2.66	1.8
ALL VEHICLES	170	5.39	3.9	59.22	42.9	526.25	142.8	4.33	1.9

TABLE 3A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS.

MODEL YEAR

LOS ANGELES

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
1966	17	7.97	11.4	98.81	42.3	532.15	153.3	3.41	2.0
1967	18	6.25	4.8	87.77	52.3	547.27	126.9	3.70	1.8
1968	21	7.63	5.6	71.74	32.4	550.45	101.8	4.94	2.0
1969	22	6.24	5.6	84.26	32.7	590.11	177.5	4.60	1.7
1970	27	7.51	7.2	90.14	42.5	553.89	113.3	4.44	1.6
1971	30	4.54	1.8	69.39	26.9	576.49	173.9	3.78	1.1
1972	35	4.07	4.9	55.66	25.4	679.11	186.3	3.83	1.2
ALL VEHICLES	170	6.04	6.2	76.96	37.9	585.04	160.4	4.10	1.6

TABLE 3A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS.

MODEL YEAR

ST. LOUIS

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
1966	17	8.25	2.7	103.85	56.9	463.76	113.0	2.98	1.6
1967	18	8.58	3.0	117.11	49.7	472.71	115.4	3.05	1.7
1968	21	7.10	5.5	76.54	44.6	529.95	128.8	4.35	1.5
1969	22	6.79	5.0	87.23	53.5	521.73	116.7	4.23	2.3
1970	27	7.13	7.1	60.79	39.2	548.52	150.1	4.41	1.8
1971	30	4.79	2.6	62.29	44.4	552.69	161.0	4.54	1.6
1972	35	3.51	1.1	42.62	23.6	621.73	167.9	4.82	1.6
ALL VEHICLES	170	6.19	4.6	72.95	49.0	542.07	149.4	4.20	1.8

TABLE 3B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
 VS. MODEL YEAR
 LOS ANGELES

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
1966	17	7.46	12.0	86.90	43.3	517.81	145.2	3.43	2.0
1967	18	5.36	4.5	75.38	45.3	536.19	123.9	3.77	1.9
1968	21	6.97	5.6	60.05	29.1	531.45	98.6	4.91	1.9
1969	22	5.42	5.4	71.61	33.1	568.73	165.3	4.68	1.7
1970	27	6.64	6.5	78.47	38.4	534.82	108.1	4.45	1.6
1971	30	3.98	1.8	59.66	26.5	560.00	164.7	3.82	1.1
1972	35	3.56	4.3	46.64	24.1	655.89	177.9	3.81	1.3
ALL VEHICLES	170	5.37	6.0	65.95	35.4	566.60	152.4	4.12	1.6

TABLE 3B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS.

MODEL YEAR

ST. LOUIS

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
1966	17	7.35	2.5	91.21	53.9	442.72	88.4	3.09	1.8
1967	18	7.65	2.7	102.24	40.0	456.79	106.7	3.07	1.7
1968	21	6.00	4.0	62.19	37.5	514.84	123.5	4.50	1.6
1969	22	5.70	4.1	67.69	45.9	508.98	112.2	4.54	2.3
1970	27	6.27	6.5	46.96	27.1	534.92	144.3	4.55	1.8
1971	30	4.21	2.3	49.59	40.4	537.48	156.2	4.67	1.6
1972	35	3.04	1.0	32.16	20.1	603.96	160.8	4.88	1.5
ALL VEHICLES	170	5.39	3.9	59.22	42.9	526.26	142.8	4.33	1.9

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TABLE 4A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. NUMBER OF CYLINDERS

LOS ANGELES

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
8	132	6.15	5.4	80.49	38.0	637.77	131.3	4.24	1.6
6	19	3.80	1.7	65.73	33.1	474.80	95.1	4.16	2.0
4	19	7.56	11.4	63.64	38.6	328.97	67.1	3.08	1.2
ALL VEHICLES	170	6.04	6.2	76.96	37.9	585.04	160.4	4.10	1.6

TABLE 4A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. NUMBER OF CYLINDERS

ST. LOUIS

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
8	129	6.41	4.5	76.58	51.7	597.96	123.5	4.43	1.8
6	21	5.81	4.0	72.85	42.9	406.49	46.4	3.89	1.8
4	20	5.15	5.6	49.65	27.3	323.86	44.8	3.04	1.4
ALL VEHICLES	170	6.19	4.6	72.95	49.0	542.06	149.4	4.20	1.8

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TABLE 4B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. NUMBER OF CYLINDERS

LOS ANGELES

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
8	132	5.39	5.0	68.29	35.2	616.87	124.4	4.28	1.6
6	19	3.22	1.4	56.88	31.4	459.92	91.5	4.10	2.0
4	19	7.34	11.9	58.74	40.0	324.01	65.6	3.02	1.2
ALL VEHICLES	170	5.37	6.0	65.95	35.4	566.60	152.4	4.12	1.6

TABLE 4B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. NUMBER OF CYLINDERS

ST. LOUIS

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
8	129	5.59	4.0	61.46	45.1	580.14	117.1	4.59	1.8
6	21	5.15	3.5	60.63	39.8	395.62	45.7	3.96	1.9
4	20	4.29	4.0	43.27	26.8	315.86	41.2	3.06	1.4
ALL VEHICLES	170	5.39	3.9	59.22	42.9	526.25	142.8	4.33	1.9

TABLE 5A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. ENGINE DISPLACEMENT (CUBIC INCHES)

LOS ANGELES

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
UNDER 251	37	5.79	8.3	65.68	35.4	398.46	109.2	3.59	1.7
251-330	44	6.79	4.8	86.65	39.4	545.86	81.5	4.10	1.8
331-399	53	6.34	6.6	75.92	34.8	633.83	91.3	4.08	1.4
OVER 399	36	4.94	3.9	78.22	41.1	752.88	141.5	4.65	1.5
ALL VEHICLES	170	6.04	6.2	76.96	37.9	585.04	160.4	4.10	1.6

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TABLE 5A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
VS. ENGINE DISPLACEMENT (CUBIC INCHES)

ST. LOUIS

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
UNDER 251	41	5.49	4.8	61.53	37.6	366.18	61.5	3.48	1.7
251-330	48	6.87	3.8	72.55	52.5	526.71	88.2	4.31	1.8
331-399	51	6.26	4.9	81.94	49.9	615.73	97.3	4.25	1.8
OVER 399	30	5.94	4.9	73.90	54.3	681.77	148.6	4.92	1.8
ALL VEHICLES	170	6.19	4.6	72.95	49.0	542.06	149.4	4.20	1.8

TABLE 5B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
 VS. ENGINE DISPLACEMENT (CUBIC INCHES)
 LOS ANGELES
 1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
UNDER 251	37	5.38	8.8	58.76	35.5	388.62	103.8	3.53	1.7
251-330	44	6.09	4.8	75.71	36.4	531.00	80.9	4.11	1.8
331-399	53	5.48	5.9	62.95	30.5	612.11	86.5	4.16	1.4
OVER 399	36	4.31	3.5	65.83	39.6	726.06	132.1	4.68	1.5
ALL VEHICLES	170	5.37	6.0	65.95	35.4	566.60	152.4	4.12	1.6

TABLE 5B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. ENGINE DISPLACEMENT (CUBIC INCHES)

ST. LOUIS

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
UNDER 251	41	4.73	3.8	52.16	34.8	356.71	59.0	3.52	1.7
251-330	48	6.08	3.4	58.48	43.2	509.49	80.3	4.42	1.8
331-399	51	5.41	4.5	66.31	43.6	600.17	90.1	4.40	1.8
OVER 399	30	5.14	4.0	57.99	50.9	659.13	140.8	5.16	1.8
ALL VEHICLES	170	5.39	3.9	59.22	42.9	526.26	142.8	4.33	1.9

TABLE 6A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
VS
VEHICLE INERTIA WEIGHT(LBS)
LOS ANGELES

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
1501-2000	6	6.84	6.9	62.86	37.8	278.21	43.5	2.69	0.9
2001-2500	8	4.31	2.1	50.87	22.5	355.01	22.9	3.76	1.0
2501-3000	33	5.95	8.5	72.26	34.0	475.69	102.0	3.99	2.1
3001-3500	36	7.27	6.4	76.50	35.5	571.92	95.8	3.98	1.8
3501-4000	47	6.69	6.5	84.47	42.6	611.79	94.6	4.06	1.3
4001-4500	28	5.10	2.7	91.63	38.8	692.21	106.2	4.42	1.4
4501-5000	10	2.96	1.2	51.24	16.2	878.05	150.7	5.18	1.1
5001-5500	2	3.53	2.6	58.05	35.2	846.35	115.8	5.01	1.5
ALL VEHICLES	170	6.04	6.2	76.96	37.9	585.04	160.4	4.10	1.6

2-72
TABLE 6A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
VS. VEHICLE INERTIA WEIGHT(LBS)
ST. LOUIS
1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
1501-2000	8	3.95	1.4	45.14	18.3	300.40	35.8	2.58	1.0
2001-2500	12	5.95	7.1	52.66	32.4	339.50	44.5	3.35	1.6
2501-3000	27	5.05	2.8	63.26	37.4	442.12	67.3	3.97	1.7
3001-3500	37	6.99	4.3	73.68	55.8	514.23	91.7	3.93	1.8
3501-4000	38	7.32	6.1	85.52	48.4	608.72	95.8	4.72	1.9
4001-4500	36	5.86	2.5	92.10	52.1	623.50	112.4	4.40	1.7
4501-5000	9	5.29	6.0	49.13	28.5	759.32	167.7	5.63	1.8
5001-5500	3	5.73	4.8	108.95	107.2	766.30	192.7	4.10	2.7
ALL VEHICLES	170	6.19	4.6	72.95	49.0	542.07	149.4	4.20	1.8

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TABLE 6B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
 VS VEHICLE INERTIA WEIGHT(LBS)
 LOS ANGELES
 1975 FEDERAL TEST PROCEDURE

	NO. OF VEH	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
1501-2000	6	6.44	7.1	59.27	39.1	271.91	45.2	2.56	1.0
2001-2500	8	3.93	2.1	44.19	19.7	351.63	22.2	3.73	1.1
2501-3000	33	5.50	8.9	65.02	34.3	462.79	99.7	3.95	2.2
3001-3500	36	6.54	6.0	65.28	32.6	553.66	91.3	3.99	1.7
3501-4000	47	5.84	6.0	71.63	40.6	591.72	90.4	4.14	1.4
4001-4500	28	4.27	2.1	76.91	33.8	671.61	101.4	4.47	1.4
4501-5000	10	2.54	1.0	39.78	16.4	840.24	135.6	5.18	1.2
5001-5500	2	2.99	1.6	45.35	29.8	816.92	118.6	5.04	1.2
ALL VEHICLES	170	5.37	6.0	65.95	35.4	566.60	152.4	4.12	1.6

2-74
TABLE 6B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. VEHICLE INERTIA WEIGHT (LBS)

ST. LOUIS

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
1501-2000	8	3.51	1.2	42.36	18.6	294.70	36.6	2.52	1.0
2001-2500	12	4.82	5.1	43.87	32.0	329.97	39.2	3.42	1.5
2501-3000	27	4.43	2.6	50.23	33.6	429.52	66.3	4.11	1.7
3001-3500	37	6.12	3.6	59.43	44.7	500.50	89.2	4.02	1.8
3501-4000	38	6.31	5.4	69.93	42.0	587.88	89.5	4.88	1.9
4001-4500	36	5.21	2.2	66.99	47.1	608.66	105.3	4.57	1.7
4501-5000	9	4.59	5.4	33.73	23.5	729.12	159.0	5.77	1.7
5001-5500	3	5.06	4.8	91.47	114.8	739.33	186.0	4.35	3.0
ALL VEHICLES	170	5.39	3.9	59.22	42.9	526.26	142.8	4.33	1.9

TABLE 7A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
 VS. TRANSMISSION TYPE
 LOS ANGELES

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AUTOMATIC	153	5.71	5.0	77.98	36.9	611.12	143.6	4.23	1.6
MANUAL	17	9.04	12.1	67.76	46.4	350.34	104.0	2.96	1.2
ALL VEHICLES	170	6.04	6.2	76.96	37.9	585.04	160.4	4.10	1.6

TABLE 7A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
 VS. TRANSMISSION TYPE
 ST. LOUIS

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AUTOMATIC	150	5.99	4.3	72.67	49.6	566.39	137.9	4.45	1.8
MANUAL	20	7.69	6.1	75.08	45.4	359.55	99.1	2.30	1.0
ALL VEHICLES	170	6.19	4.6	72.95	49.0	542.06	149.4	4.20	1.8

2-77

TABLE 7B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS.

TRANSMISSION TYPE

LOS ANGELES

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AUTOMATIC	153	5.00	4.6	66.38	34.0	591.09	136.7	4.26	1.6
MANUAL	17	8.72	12.7	62.05	47.5	346.17	101.2	2.91	1.3
ALL VEHICLES	170	5.37	6.0	65.95	35.4	566.60	152.4	4.12	1.6

2-78

TABLE 7B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS.

TRANSMISSION TYPE

ST. LOUIS

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
AUTOMATIC	150	5.21	3.8	57.99	43.3	549.38	131.8	4.60	1.8
MANUAL	20	6.73	4.9	68.45	39.8	352.75	97.0	2.28	1.0
ALL VEHICLES	170	5.39	3.9	59.22	42.9	526.25	142.8	4.33	1.9

TABLE 8A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. NUMBER OF CARBURETOR VENTURIS

LOS ANGELES

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
FOUR VENTURIS	42	5.72	4.1	88.58	48.2	690.78	156.4	4.06	1.6
TWO VENTURIS	98	6.15	5.8	74.83	31.9	590.88	123.8	4.31	1.6
ONE VENTURI	29	6.27	9.4	68.78	37.6	417.75	139.4	3.49	1.8
FUEL INJECT.	1	2.34	0.0	34.98	0.0	424.03	0.0	3.05	0.0
ALL VEHICLES	170	6.04	6.2	76.96	37.9	585.04	160.4	4.10	1.6

TABLE 8A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. NUMBER OF CARBURETOR VENTURIS

ST. LOUIS

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
FOUR VENTURIS	34	6.49	4.7	90.16	61.6	614.54	160.2	3.98	2.1
TWO VENTURIS	103	6.27	4.4	70.85	46.3	574.93	120.1	4.46	1.7
ONE VENTURI	33	5.61	5.1	61.79	38.3	364.80	63.3	3.63	1.8
FUEL INJECT.	0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
ALL VEHICLES	170	6.19	4.6	72.95	49.0	542.06	149.4	4.20	1.8

TABLE 8B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. NUMBER OF CARBURETOR VENTURIS

LOS ANGELES

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
FOUR VENTURIS	42	4.96	3.6	74.86	43.7	669.83	144.8	4.08	1.6
TWO VENTURIS	98	5.42	5.4	63.83	30.1	571.36	117.8	4.36	1.5
ONE VENTURI	29	5.88	9.8	61.18	38.3	406.04	133.6	3.42	1.8
FUEL INJECT.	1	2.59	0.0	37.38	0.0	422.02	0.0	3.23	0.0
ALL VEHICLES	170	5.37	6.0	65.95	35.4	566.60	152.4	4.12	1.6

TABLE 8B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

VS. NUMBER OF CARBURETOR VENTURIS

ST. LOUIS

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO ₂		NO _x C	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
FOUR VENTURIS	34	5.61	3.7	74.97	58.3	598.90	149.6	4.15	2.2
TWO VENTURIS	103	5.49	4.0	56.12	38.1	557.13	114.8	4.61	1.7
ONE VENTURI	33	4.83	4.0	52.65	35.3	355.03	61.0	3.65	1.8
FUEL INJECT.	0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
ALL VEHICLES	170	5.39	3.9	59.22	42.9	526.25	142.8	4.33	1.9

TABLE 9A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

REPLICATE TESTING USING PAIRED T TEST

LOS ANGELES

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
FIRST TEST	10	7.92	10.6	68.11	30.2	638.04	136.7	4.20	1.0
SECOND TEST	10	6.72	10.4	62.41	27.2	619.04	130.9	3.92	0.9
BETWEEN TESTS (PAIRED T)	10	1.20	2.2	5.71	9.5	19.01	71.1	0.28	0.6

2-84

TABLE 9A

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

REPLICATE TESTING USING PAIRED T TEST

ST. LOUIS

1972 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
FIRST TEST	10	5.15	2.9	62.66	46.3	503.38	138.7	4.42	1.9
SECOND TEST	10	5.02	2.4	65.49	41.1	499.13	135.7	4.28	1.6
BETWEEN TESTS (PAIRED T)	10	0.13	1.3	-2.84	16.9	4.25	17.1	0.14	0.5

2-85

TABLE 9B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE

REPLICATE TESTING USING PAIRED T TEST

LOS ANGELES

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
FIRST TEST	10	6.74	9.5	56.78	28.5	616.17	126.7	4.19	1.0
SECOND TEST	10	6.24	10.1	53.32	26.5	606.06	133.2	3.88	0.9
BETWEEN TESTS (PAIRED T)	10	0.50	1.3	3.45	6.0	10.10	80.0	0.31	0.6

2-86

TABLE 9B

EXHAUST EMISSION TEST RESULTS IN GRAMS/MILE
 REPLICATE TESTING USING PAIRED T TEST

ST. LOUIS

1975 FEDERAL TEST PROCEDURE

	NO. OF VEH.	HC		CO		CO2		NOXC	
		MEAN	S. D.	MEAN	S. D.	MEAN	S. D.	MEAN	S. D.
FIRST TEST	10	4.46	2.4	51.06	37.8	490.55	134.4	4.52	1.9
SECOND TEST	10	4.31	2.2	50.04	33.4	486.84	134.0	4.41	1.6
BETWEEN TESTS (PAIRED T)	10	0.15	0.7	1.01	8.9	3.71	16.5	0.11	0.5

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TABLE 10A

VEHICLES MEETING 1972 FEDERAL STANDARDS

LOS ANGELES

1972 FEDERAL TEST PROCEDURE

	HC		CO		BOTH HC AND CO	
	<3.4 NO.	GM/MI PCT.	<39 NO.	GM/MI PCT.	<3.4 NO.	GM/MI AND <39 PCT. GM/MI
AMC	3	60.0	2	40.0	2	40.0
BUICK	5	41.7	3	25.0	2	16.7
CADILLAC	3	75.0	2	50.0	2	50.0
CHEVROLET	14	35.9	7	18.0	5	12.8
CHRYSLER	0	0.0	0	0.0	0	0.0
DATSUN	1	50.0	1	50.0	1	50.0
DODGE	2	20.0	0	0.0	0	0.0
FORD	7	20.0	5	14.3	1	2.9
LINCOLN	0	0.0	0	0.0	0	0.0
MERCURY	1	14.3	0	0.0	0	0.0
OLDSMOBILE	4	36.4	1	9.1	1	9.1
OPEL	0	0.0	0	0.0	0	0.0
PLYMOUTH	1	8.3	1	8.3	0	0.0
PONTIAC	2	14.3	0	0.0	0	0.0
TOYOTA	1	33.3	1	33.3	1	33.3
VOLKSWAGEN	3	30.0	3	30.0	2	20.0
1966	2	11.8	1	5.9	0	0.0
1967	5	27.8	2	11.1	2	11.1
1968	3	14.3	4	19.1	1	4.8
1969	4	18.2	2	9.1	1	4.6
1970	3	11.1	3	11.1	2	7.4
1971	10	33.3	3	10.0	1	3.3
1972	20	57.1	11	31.4	10	28.6
ALL VEHICLES	47	27.7	26	15.3	17	10.0

TABLE 10A

VEHICLES MEETING 1972 FEDERAL STANDARDS

ST. LOUIS

1972 FEDERAL TEST PROCEDURE

	HC		CO		BOTH HC AND CO	
	<3.4 NO.	GM/MI PCT.	<39 NO.	GM/MI PCT.	<3.4 NO.	GM/MI AND <39 PCT.
AMC	3	60.0	3	60.0	3	60.0
BUICK	4	33.3	2	16.7	2	16.7
CADILLAC	3	75.0	1	25.0	1	25.0
CHEVROLET	7	18.0	9	23.1	4	10.3
CHRYSLER	0	0.0	0	0.0	0	0.0
DATSUN	1	50.0	0	0.0	0	0.0
DODGE	1	10.0	3	30.0	1	10.0
FORD	5	14.3	12	34.3	4	11.4
LINCOLN	0	0.0	0	0.0	0	0.0
MERCURY	1	14.3	4	57.1	1	14.3
OLDSMOBILE	2	18.2	1	9.1	1	9.1
OPEL	1	100.0	0	0.0	0	0.0
PLYMOUTH	3	25.0	4	33.3	2	16.7
PONTIAC	0	0.0	2	14.3	0	0.0
TOYOTA	2	66.7	2	66.7	2	66.7
VOLKSWAGEN	4	40.0	5	50.0	4	40.0
1966	0	0.0	1	5.9	0	0.0
1967	0	0.0	0	0.0	0	0.0
1968	2	9.5	5	23.8	1	4.8
1969	3	13.6	4	18.2	1	4.6
1970	6	22.2	10	37.0	5	18.5
1971	8	26.7	10	33.3	5	16.7
1972	18	51.4	18	51.4	13	37.1
ALL VEHICLES	37	21.8	48	28.2	25	14.7

Table 11
EVAPORATIVE EMISSION TEST RESULTS
(Los Angeles)
SHED PROCEDURE

Number of Vehicles	20
Diurnal Soak: Time in Minutes	60
Enclosure Temperature °F	76.5
Internal Temperature °F	83.9
HC (GMS)	12.07
Hot Soak: Time in Minutes	60
Enclosure Temperature °F	85.8
Internal Temperature °F	93.7
HC (GMS)	12.05
Combined Losses: HC (GMS)	24.12
Fuel Inspection Results:	
Reid Vapor Pressure	8.71
Hydrogen/Carbon Ratio	2.49
Fuel Distillation Temperatures °F	
Initial Boiling Point	92.4
5% Evaporated	112.4
10% "	129.4
15% "	143.4
20% "	158.0
30% "	185.5
40% "	206.8
50% "	223.2
90% "	310.3
Final Boiling Point	358.2
Average Differences Between Original and Replicate Tests N= 2	
Number of Pairs	2
Diurnal: HC/ (GMS)	10.64
Hot Soak: HC/ (GMS)	5.07
Combined: HC/ (GMS)	15.72

3. APPENDIX

This section contains vehicle information for each test car in each of the two cities.

3.1 VEHICLE INFORMATION SUMMARY

Table 12 lists individual vehicle information by city. The following is a description of the various abbreviations used in the headings.

<u>HEADING</u>	<u>DESCRIPTION</u>
S	Test site--city in which vehicles were tested.
C	Contractor performing tests.
CAR	This is a four-digit number assigned each test vehicle at each facility. All Project 2050 car numbers used zero (0) as the first digit. The order and format of test vehicles in this section are identical to that in all sections of the Appendix. This arrangement is used to permit each determination of vehicle identification.
R	Number 1 in this column indicates a replicate test was performed.
RUN	RUN is a four-digit sequential run number.
DATE	This is a six-digit number showing year, month and day.
YR	This is a two-digit number indicating the model year of the test vehicle.
CD	This is a two-digit number showing the EPA-assigned make code.
MAKE	This is a four-character word specifying the make of vehicle. The first four characters of the vehicle make are always to be used. For example: Wildcat = WILD; Ford LTD = LTD; Pontiac LeMans = LEMA, etc.
CID	This is a three-digit number indicating the cubic inch displacement of the test vehicle. In the case of small displacement engines, round off to the nearest unit displacement. For example: Volkswagen = 96.6 cubic inches displacement. Input should be 097.
V	This indicates the number of carburetor barrels or venturis. If a given vehicle has fuel injection, a "0" is inserted instead of the number for venturis. A vehicle with multiple carburetion would be entered as total number of venturis. Example: 3 - 2 BBLs = 6.
T	This is a single-digit number. It indicates the type of transmission used. A 1 = automatic; 3, 4 = manual, specify number of gears.
INRT	INRT designates the inertia of the vehicle as a four-digit number. Correct inertia may be obtained from the <u>Federal Register</u> , Volume 35, No. 219, Part II, page 17,296.

HP	HP is the road horsepower setting for the given test vehicle on the dynamometer. The <u>Federal Register</u> will provide the correct load settings.
WB	This is a two-digit number indicating the wet bulb temperature in °F.
DB	This is a two-digit number indicating the dry bulb temperature in °F.
BARM	This is a four-digit number indicating the barometric pressure in inches of mercury.
CY	Indicates the number of cylinders in the test vehicle engine. A single-digit number.
AC	A single-digit number to indicate the presence of an air conditioning system on the test vehicle. 1 = equipped with air conditioner; 2 = no air conditioner.
EV	This is a single-digit number to indicate whether or not the test vehicle is equipped with an evaporative emissions control device. 1 = the vehicle is equipped with such a device; 2 = no evaporative emissions device present.
EX	EX is a single-digit which indicates the presence of an exhaust emissions control system. 1 = exhaust emissions control present; 2 = no exhaust controls.
PC	This indicates the presence of a positive crankcase ventilation system. 1 = PCV system present; 2 = no PCV control unit.
ODOM	This is a five-digit number indicating the odometer reading of the test vehicle at the start of the test.
FT	A two-digit number indicating the fuel tank capacity of the test vehicle. Round off to the nearest gallon.
IRPM	Idle speed in revolutions per minute measured in drive or neutral.
DN	Drive or neutral. 1 = drive; 2 = neutral.
DWL	Distributor ignition dwell in degrees, 0 = electronic ignition
IGNT	Basic ignition timing; + indicates before top center; - indicates after top center. Absence of + or - indicates that timing was before top center.

10% LOAD

Indicates 10% load added. 1 = yes; 2 = no.

ET

This indicates that evaporative emissions tests were performed.
1 indicates evaporative test performed; 2 indicates no evaporative
test performed.

TABLE 12

VEHICLE INFORMATION SUMMARY

LOS ANGELES

S C	CAP F	OWN	DATE	CR	CD	MAKE	MOD	CID	Y	INF	4F	DB	B-TM	C	A	E	P	DOM	FT	TRPM	N	D	DWL	IGNT	LE	DT
41	1	1	73	212	70	3	FORD	MAVE	250	1	2500	3	80	30	08	3	1	1	25724	20	500	1	53	11	1	1
41	1	1	73	212	70	3	FORD	MAVE	250	1	2500	3	80	30	08	3	1	1	30084	10	925	2	54	10	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	40193	23	675	1	29	2	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	64072	24	600	1	35	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	37184	21	650	1	29	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	52066	16	490	1	30	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	5878	16	625	1	35	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	20992	19	750	1	28	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	6074	21	500	1	28	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	33512	18	600	1	28	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	74400	20	450	1	29	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	5460	10	775	2	49	5	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	93974	20	550	1	28	7	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	85988	20	675	1	33	10	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	16982	10	875	2	36	7	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	65620	24	500	1	27	7	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	20931	23	425	1	32	6	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	63641	24	575	1	31	2	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	51638	23	550	1	33	4	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	54443	20	450	1	45	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	17454	16	480	1	32	6	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	17495	16	750	2	31	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	64350	27	575	1	33	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	19513	23	425	1	0	4	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	73485	18	425	1	29	10	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	19816	19	575	1	32	8	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	23519	20	500	1	30	4	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	17400	12	1150	2	33	8	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	17501	12	1150	2	33	8	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	60812	16	650	1	39	0	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	13857	18	600	1	28	0	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	51484	25	650	1	25	6	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	6085	26	600	2	35	10	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	40668	20	475	1	31	9	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	14419	16	550	1	28	0	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	70448	10	1600	2	60	5	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	25068	10	575	2	37	5	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	47055	23	725	1	30	8	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	51876	19	475	1	29	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	40954	14	700	1	46	4	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	78505	20	500	1	20	4	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	8126	27	600	1	26	4	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	30389	17	625	1	31	7	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	38400	20	650	1	30	8	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	38423	20	650	1	30	8	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	21810	16	700	1	36	5	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	52032	24	650	1	30	3	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	29970	20	475	1	28	10	1	1
41	1	1	73	212	70	3	CHEV	CHEV	327	1	4000	3	85	30	20	4	1	1	49331	23	600	1	30	10	1	1

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VEHICLE INFORMATION SUMMARY

LOS ANGELES

SC	CAR	F	RUN	DATE	VR	CD	MAKE	MOD.	CID	Y	T	INPT	HP	WZ	DB	EA	Y	C	E	F	ODOM	FT	IRPH	N	DML	IGNIT	LE
41	50		107	73	215	67	4	FORD FAIR	289	2	1	3500	11	2	11	82	30	14	8	2	2	2	2	2	2	2	2
41	51		116	73	316	68	1	BUIC SKYL	350	2	1	3500	11	2	11	82	30	14	8	2	2	2	2	2	2	2	2
41	52		122	73	319	67	3	MERC COLO	410	4	1	4500	14	0	64	76	30	16	8	1	2	1	1	1	1	1	1
41	53		506	73	324	68	5	PONT LEA	350	2	1	4000	12	0	76	30	16	8	1	2	1	1	1	1	1	1	1
41	54		134	73	320	71	3	CHEV IMPA	350	2	1	4500	14	0	83	30	16	8	1	2	1	1	1	1	1	1	1
41	55		145	73	321	71	10	DODG SHIN	318	2	1	3000	10	3	67	77	30	16	8	2	1	1	1	1	1	1	1
41	56		146	73	321	66	5	FORD MUST	200	1	1	3000	10	0	52	78	30	16	8	2	1	1	1	1	1	1	1
41	57		153	73	322	70	6	FORD FALC	302	2	1	3500	11	2	61	77	30	16	8	2	1	1	1	1	1	1	1
41	58		163	73	323	66	16	VOLK BUG	78	1	4	2750	8	8	67	81	30	12	4	2	2	2	2	2	2	2	
41	59		189	73	326	69	5	PONT CATA	400	2	1	4000	13	2	62	76	30	16	8	2	1	1	1	1	1	1	1
41	60		164	73	323	70	6	FORD GALA	351	2	1	4000	13	2	63	76	30	16	8	1	2	1	1	1	1	1	1
41	61		187	73	326	71	3	CHEV IMPA	350	4	1	4000	13	2	65	76	30	16	8	1	2	1	1	1	1	1	1
41	62		198	73	327	71	3	CHEV IMPA	350	4	1	4000	13	2	65	76	30	16	8	1	2	1	1	1	1	1	1
41	63		190	73	326	70	3	CHEV CHEL	402	4	4	3500	11	2	65	77	30	16	8	2	1	1	1	1	1	1	1
41	64		201	73	327	70	5	PONT LEHA	350	2	1	4000	12	0	62	77	30	16	8	1	1	1	1	1	1	1	1
41	65		206	73	328	66	12	PLYM VALI	225	1	1	3000	10	3	64	78	30	16	8	2	1	1	1	1	1	1	1
41	66		210	73	328	70	3	CHEV EL	307	2	1	3500	11	2	60	76	30	16	8	1	1	1	1	1	1	1	1
41	67		211	73	328	70	4	OLDS CUTL	350	2	1	4000	13	2	65	80	30	16	8	1	1	1	1	1	1	1	1
41	68		214	73	328	68	5	FORD FAIR	302	2	1	3500	11	2	61	79	30	16	8	2	1	1	1	1	1	1	1
41	69		212	73	328	69	5	PONT CATA	400	2	1	4000	13	2	66	80	30	16	8	2	1	1	1	1	1	1	1
41	70		218	73	329	69	4	OLDS VIST	350	4	1	4500	12	7	66	81	30	15	8	2	1	1	1	1	1	1	1
41	71		220	73	330	69	3	CHEV NOVA	230	1	1	3000	10	3	63	78	30	16	8	2	1	1	1	1	1	1	1
41	72		229	73	330	71	15	TOYO CORO	113	2	1	2500	9	4	66	77	30	16	8	2	1	1	1	1	1	1	1
41	73		231	73	330	66	5	PONT VENT	389	2	1	4000	13	2	66	82	30	16	8	2	1	1	1	1	1	1	1
41	74		250	73	4	2	71	6	FORD LTD	351	2	1	4000	13	2	62	77	30	16	8	1	1	1	1	1	1	1
41	75		240	73	4	2	71	16	VOLK BUS	97	1	4	3000	10	3	66	77	30	16	8	1	1	1	1	1	1	1
41	76		251	73	4	2	68	12	PLYM FURY	318	2	1	3500	11	2	64	79	30	16	8	1	1	1	1	1	1	1
41	77		252	73	4	3	71	1	BUIC CENT	435	2	1	4500	14	0	62	79	30	16	8	1	1	1	1	1	1	1
41	78		257	73	4	3	69	4	OLDS DELT	435	2	1	4000	13	2	64	84	30	16	8	1	1	1	1	1	1	1
41	79		259	73	4	3	72	6	FORD LTD	429	4	1	4500	14	0	63	79	30	16	8	1	1	1	1	1	1	1
41	80		254	73	4	3	70	13	AMER AMBA	304	2	1	4000	12	0	66	85	30	16	8	1	1	1	1	1	1	1
41	81		260	73	4	4	72	1	BUIC SKYL	350	2	1	4000	13	2	63	85	30	16	8	1	1	1	1	1	1	1
41	82		263	73	4	4	72	1	BUIC SKYL	350	2	1	4000	13	2	63	85	30	16	8	1	1	1	1	1	1	1
41	83		263	73	4	4	68	6	FORD GALA	390	4	1	4000	13	2	64	84	30	16	8	1	1	1	1	1	1	1
41	84		265	73	4	4	70	10	DODG DART	225	1	1	3000	10	3	61	77	30	16	8	1	1	1	1	1	1	1
41	85		266	73	4	4	66	1	BUIC SPEC	340	4	1	3500	11	2	60	80	30	16	8	1	1	1	1	1	1	1
41	86		268	73	4	5	71	3	CHEV NOVA	350	2	1	3500	12	3	59	78	30	16	8	1	1	1	1	1	1	1
41	87		272	73	4	5	68	4	OLDS DELT	435	2	1	4500	14	0	64	79	30	16	8	1	1	1	1	1	1	1
41	88		272	73	4	5	68	4	OLDS DELT	435	2	1	4500	14	0	64	79	30	16	8	1	1	1	1	1	1	1
41	89		273	73	4	5	70	1	BUIC RIVI	455	4	1	4500	14	0	62	76	30	16	8	1	1	1	1	1	1	1
41	90		269	73	4	5	71	16	VOLK BUG	97	1	4	2000	8	3	63	81	30	12	4	2	1	1	1	1	1	1
41	91		274	73	4	5	70	12	PLYM SPOR	383	2	1	4500	14	0	66	79	30	16	8	1	1	1	1	1	1	1
41	92		275	73	4	5	67	4	OLDS DELT	425	2	1	4500	14	0	65	79	30	16	8	1	1	1	1	1	1	1
41	93		276	73	4	5	68	6	FORD TORI	390	4	1	4500	11	2	64	76	30	16	8	1	1	1	1	1	1	1
41	94		277	73	4	6	71	12	PLYM SATE	225	1	1	3500	11	2	65	76	30	16	8	2	1	1	1	1	1	1
41	95		299	73	4	6	71	16	VOLK KARM	91	1	4	2000	8	3	65	82	30	16	8	2	1	1	1	1	1	1
41	96		283	73	4	6	68	8	MERC MONG	302	2	1	3500	11	2	59	82	30	16	8	2	1	1	1	1	1	1
41	97		295	73	4	6	69	1	BUIC RIVI	430	4	1	4500	14	0	62	77	30	16	8	1	1	1	1	1	1	1
41	98		291	73	4	6	69	15	VOLK BUS	97	1	4	3000	10	3	65	81	30	16	8	1	1	1	1	1	1	1
41	99		284	73	4	6	71	5	FORD PINT	98	1	4	2250	8	3	62	84	30	16	8	2	1	1	1	1	1	1
41	100		292	73	4	6	70	9	CHRY 300	440	4	1	4500	14	0	63	79	30	16	8	1	1	1	1	1	1	1
41	101		293	73	4	6	69	3	CHEV IMPA	327	2	1	4000	12	0	65	84	30	16	8	1	1	1	1	1	1	1

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TABLE 12

VEHICLE INFORMATION SUMMARY

LOS ANGELES

S/C	CAR #	PLN	DATE	IR	CD	MAKE	MOD	CID	Y	THPT	HP	WE	DB	BARM	C	A	E	F	ODOM	FT	IRPM	N	DML	IGNT	D	LT
4 1	102	297	73 411 68	9	CHRY	NEMP	383	2	1	4000	13	2 62	76	30	13	8	1	2	1	76608	24	425	1	27	7	1
4 1	103	301	73 412 69	6	FORD	MUST	302	2	1	3000	10	3 63	78	30	16	8	2	2	1	62073	20	525	1	36	4	1
4 1	104	306	73 412 69	3	CHEV	EL C	307	2	1	3500	11	2 63	76	30	10	8	2	2	1	31259	20	450	1	27	10	2
4 1	105	285	73 410 71	7	LINC	CONT	460	4	1	5000	14	7 65	78	30	15	8	1	1	1	37505	23	575	1	27	4	1
4 1	106	290	73 410 68	6	FORD	MUST	289	2	1	3000	11	3 64	82	30	11	8	2	2	1	53480	13	600	1	33	15	1
4 1	107	298	73 410 67	12	PLYM	FURY	319	2	1	4000	13	2 62	76	30	12	8	2	2	1	72114	25	500	1	32	10	2
4 1	108	305	73 412 72	3	CHEV	IMPA	400	2	1	4500	14	0 64	79	30	13	8	1	1	1	34697	24	500	1	29	6	1
4 1	109	302	73 412 72	6	FORD	TORI	351	2	1	4000	13	2 63	78	30	14	8	1	1	1	22666	20	400	1	27	7	2
4 1	110	327	73 417 70	6	FORD	SVAN	302	2	1	4000	12	0 63	79	30	16	8	2	2	1	113683	20	425	2	26	4	1
4 1	111	317	73 416 70	12	PLYM	BARR	318	2	1	3500	12	3 61	78	30	23	8	1	1	1	40593	18	575	1	24	4	1
4 1	112	479	73 517 72	9	CHRY	ROYA	400	2	1	4500	14	0 66	79	30	18	8	1	1	1	16007	24	500	1	32	4	1
4 1	113	319	73 416 67	3	CHEV	BELA	250	1	1	4000	12	0 64	81	30	21	6	2	2	1	77114	24	550	1	35	4	2
4 1	114	305	73 412 66	10	DODG	POLA	383	2	1	4000	13	2 64	78	30	12	8	1	2	1	52835	25	425	1	25	5	1
4 1	115	315	73 416 66	3	MERC	MONC	390	1	1	4000	13	2 61	78	30	22	8	1	2	1	67927	25	500	1	26	6	1
4 1	117	326	73 417 67	9	CHRY	300	383	4	1	4500	14	0 65	82	30	17	8	1	2	1	99319	25	575	2	29	5	1
4 1	118	312	73 412 68	2	CADI	COUP	472	4	1	5000	14	7 67	77	30	15	8	1	2	1	45502	26	475	1	32	5	1
4 1	119	320	73 416 66	4	OLDS	CUTL	330	2	1	3500	11	2 63	79	30	20	8	2	2	1	110355	20	425	1	30	10	2
4 1	120	322	73 416 70	16	VOLK	BEET	97	1	4	2000	8	3 64	79	30	18	4	2	1	1	39471	10	725	2	56	0	2
4 1	122	329	73 417 72	3	CHEV	IMPA	307	2	1	4000	13	2 63	78	30	16	8	1	1	1	9453	19	550	1	26	9	1
4 1	123	338	73 418 68	3	CHEV	CONC	350	2	1	4000	12	0 58	77	30	04	8	2	2	1	72163	24	475	1	29	4	2
4 1	124	330	73 417 72	3	CHEV	CHEL	350	2	1	3500	12	3 63	79	30	15	8	1	1	1	6952	19	500	1	30	9	1
4 1	125	334	73 417 67	6	FORD	LTD	390	2	1	4000	13	2 63	81	30	10	8	1	2	1	54804	25	400	1	29	41	1
4 1	126	340	73 418 66	2	CADI	SEDA	429	4	1	5000	14	7 58	80	29	98	8	1	2	1	72173	26	450	1	28	13	1
4 1	127	337	73 417 67	5	PONT	BONN	400	4	1	4500	14	0 63	79	30	08	8	1	2	1	81366	27	550	1	28	19	2
4 1	128	355	73 420 70	15	TOYO	CORO	116	2	1	2500	9	4 61	77	29	99	4	2	1	1	43152	12	550	1	59	32	1
4 1	129	332	73 417 67	3	CHEV	MALI	327	4	1	3500	11	2 63	79	30	14	8	2	2	1	82778	20	350	1	28	11	1
4 1	130	310	73 413 72	3	CHEV	CONC	350	4	1	4000	13	2 63	79	30	15	8	1	1	1	13637	18	575	1	28	11	1
4 1	131	352	73 419 67	6	FORD	MUST	289	2	1	3000	10	3 60	80	29	97	8	2	2	1	52127	16	550	1	37	0	1
4 1	132	360	73 420 69	12	PLYM	SATE	318	2	1	3500	12	3 59	80	29	99	8	1	2	1	51513	19	450	1	32	8	2
4 1	133	595	73 6 9 72	3	CHEV	VEGA	140	2	1	2750	9	9 67	79	30	02	4	2	1	1	15943	11	575	1	30	8	2
4 1	134	369	73 423 67	3	CHEV	CAPR	327	4	1	4000	12	0 63	79	30	03	8	1	2	1	78689	24	525	1	26	12	2
4 1	135	371	73 423 67	13	AMER	RAMB	232	2	1	3000	10	3 63	78	30	02	6	2	2	1	49112	16	600	1	34	12	2
4 1	136	375	73 425 71	10	DODG	MONA	383	4	1	4500	14	0 62	76	30	04	8	1	1	1	23834	23	525	1	32	4	1
4 1	137	382	73 426 69	3	CHEV	CAMA	307	2	1	3500	11	2 63	79	30	21	6	2	2	1	18470	11	925	2	53	18	2
4 1	138	417	73 5 1 68	3	CHEV	NOVA	250	1	3	3000	10	3 63	79	30	21	6	2	2	1	53504	18	600	2	34	-3	2
4 1	139	414	73 5 1 71	17	OLPE	MADE	116	2	4	2500	9	4 63	77	30	21	4	2	1	1	18740	23	500	1	28	6	1
4 1	140	461	73 511 72	4	GLDS	CUST	455	4	1	5500	15	3 66	81	30	11	8	1	1	1	40194	24	550	1	30	4	1
4 1	141	433	73 5 3 71	4	OLDS	NINE	455	4	1	4500	14	0 64	80	30	13	8	1	1	1	18740	23	500	1	28	6	1
4 1	142	439	73 5 4 71	1	BUIC	RIVL	455	4	1	4500	14	0 64	79	30	04	8	1	1	1	26865	24	575	1	30	8	1
4 1	143	458	73 510 72	15	TOYO	CELL	120	2	4	2500	9	4 64	76	30	05	4	2	1	1	13026	13	675	2	54	6	2
4 1	144	440	73 5 7 69	12	PLYM	BARR	318	2	1	3000	10	3 61	76	30	19	8	1	2	1	49747	18	700	1	31	5	2
4 1	145	442	73 5 7 71	3	CHEV	CAMA	350	4	1	3500	12	3 65	79	30	16	8	1	1	1	33934	17	500	1	34	7	1
4 1	146	524	73 530 72	3	CHEV	MALI	350	2	1	3500	12	3 65	79	30	16	8	1	1	1	24134	19	350	1	29	7	1
4 1	147	444	73 5 8 71	3	CHEV	MALI	350	2	1	3500	12	3 64	77	30	14	8	1	1	1	25464	19	450	1	32	7	1
4 1	148	446	73 5 8 67	3	CHEV	IMPA	283	2	1	4000	12	0 66	81	30	15	8	1	2	1	64889	24	475	1	31	6	2
4 1	149	448	73 5 9 69	3	CHEV	BEL	327	2	1	4000	13	2 63	76	30	10	8	2	2	1	80152	24	550	1	27	3	1
4 1	150	454	73 510 69	13	CHRY	REBE	290	2	1	3500	11	2 65	80	30	09	8	2	2	1	80163	24	550	1	27	3	1
4 1	151	456	73 510 68	13	RAMB	REBE	290	2	1	3500	11	2 65	81	30	04	8	2	2	1	49285	22	525	1	30	-5	2
4 1		451	73 5 9 70	5	PONT	TEMP	350	2	1	4000	13	2 66	80	30	08	8	1	1	1	46852	19	450	1	37	-1	1

TABLE 12
VEHICLE INFORMATION SUMMARY
LOS ANGELES

S C	CAR	R	RUN	DATE	VR	CD	MAKE	MOD	CID	V	T	INRT	HF	WB	DB	EARM	Y C V X C	A E E P	ODDH	FT	IRPM	N	DIAL	IGNT	L	D	T
4 1	151	R	453	73	510	70	5	PONT	TEMP	350	2	1	4000	13	2	64	76	30	05	8	1	1	1	37	-1	1	1
4 1	152		457	73	510	71	4	OLDS	DELT	350	2	1	4500	14	0	64	78	30	05	8	1	1	28	6	1	1	1
4 1	153		464	73	510	72	3	MERC	MONG	400	2	1	4500	14	0	64	78	30	10	8	1	1	30	1	1	1	1
4 1	154		459	73	510	71	3	CHEV	KING	400	2	1	5000	14	7	64	77	30	03	8	1	1	14	9	1	1	1
4 1	155		465	73	514	71	5	PONT	FIRE	350	2	1	3500	12	3	64	77	30	12	8	1	1	30	3	1	1	1
4 1	156		466	73	514	72	13	AMER	HORN	258	1	1	3000	10	3	64	76	30	15	6	1	1	34	7	1	1	1
4 1	157		467	73	514	66	3	CHEV	IMPA	283	2	1	4000	12	0	64	79	30	18	8	2	1	30	4	1	1	1
4 1	158	R	468	73	515	66	3	CHEV	IMPA	283	2	1	4000	12	0	65	79	30	28	8	2	1	30	1	1	1	1
4 1	159		470	73	515	72	3	CHEV	CAMA	350	2	1	4000	13	2	65	80	30	30	8	1	1	29	7	1	1	1
4 1	160		469	73	515	71	6	FORD	GALA	351	2	1	4000	12	0	65	80	30	30	8	1	1	33	14	1	1	1
4 1	161		476	73	516	72	10	DODG	DART	225	1	1	3000	10	3	65	78	30	24	6	2	1	40	4	1	1	1
4 1	162		472	73	516	67	10	DODG	DART	225	1	1	3000	10	3	64	77	30	27	6	1	1	44	3	1	1	1
4 1	163		478	73	517	72	5	PONT	LEMA	350	2	1	4000	13	2	65	78	30	22	8	1	1	23	15	1	1	1
4 1	164		473	73	516	72	2	CADI	SEDA	472	4	1	5000	14	7	65	78	30	27	8	1	1	28	8	1	1	1
4 1	165		483	73	518	72	16	VOLK	SUPE	97	1	4	2250	8	8	65	78	30	12	4	2	1	52	15	1	1	1
4 1	166		481	73	518	72	12	PLYM	FURY	360	2	1	4000	13	2	64	76	30	16	8	1	1	0	-3	1	1	1
4 1	167		526	73	530	72	15	VOLK	411	102	0	1	2750	9	9	64	78	30	00	4	1	1	49	7	1	1	1
4 1	168		502	73	523	72	1	BUIC	ELEC	455	4	1	5000	14	7	63	79	30	09	8	1	1	31	4	1	1	1
4 1	169		515	73	524	72	1	BUIC	ELEC	455	4	1	5000	14	7	62	76	30	00	8	1	1	25	3	1	1	1
4 1	169	R	521	73	525	72	1	BUIC	ELEC	455	4	1	5000	14	7	64	76	30	01	8	1	1	30	6	1	1	1
4 1	170		507	73	524	72	12	PLYM	DUST	340	4	1	3500	11	2	63	76	30	06	8	1	1	30	6	1	1	1
4 1	170	R	519	73	525	72	12	PLYM	DUST	340	4	1	3500	11	2	64	76	30	03	8	1	1	36	11	1	1	1
4 1	172		513	73	524	72	5	PONT	WAGG	400	2	1	5000	14	7	63	76	30	00	8	1	1	31	11	1	1	1
4 1	173		516	73	525	69	10	DODG	CHAR	440	4	1	4000	12	0	63	76	30	03	8	1	1	31	11	1	1	1
4 1	174		523	73	530	70	4	OLDS	DEL	350	2	1	4500	14	0	64	76	29	99	8	1	1	34	-3	1	1	1
4 1	175		535	73	531	69	6	FORD	MUST	250	1	1	3000	10	3	64	76	30	02	6	2	1	29	8	1	1	1
4 1	176		531	73	531	70	10	DODG	CHAR	440	4	1	4000	12	0	65	77	30	00	8	1	1	29	8	1	1	1
4 1	177		594	73	6	9	66	6	FORD	COUN	390	4	1	4500	12	7	67	80	30	02	8	1	26	12	1	1	1
4 1	178		587	73	6	8	72	3	CHEV	IMPA	402	4	1	4500	14	0	68	72	30	02	8	1	26	16	1	1	1
4 1	179		599	73	6	9	72	6	FORD	E-10	302	2	1	4000	12	0	67	78	30	00	8	1	29	7	1	1	1
4 1	179		599	73	6	9	72	6	FORD	E-10	302	2	1	4000	12	0	67	78	30	00	8	1	33	12	1	1	1

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TABLE 12
VEHICLE INFORMATION SUMMARY

ST LOUIS

CAR	R	SUN	DATE	VR	CD	MAKE	MOD	12	V	T	INRT	MP	WB	DB	BURH	Y	C	V	X	C	E	F	P	D	IRPM	N	DML	IGNT	L	D	T	
5	1	1	73	131	67	16	VOLK BCS	91	1	4	2250	3	2	12	79	25	17	4	2	2	2	1	1	1	43	750	2	43	6	2	2	2
5	1	1	73	131	72	16	CHEV IMPA	350	2	1	4500	14	0	60	77	25	18	8	2	1	1	1	1	30	530	1	30	6	1	2	2	
5	1	1	73	131	72	16	CADI COU	126	4	1	3500	15	3	12	79	25	15	8	1	1	1	1	1	29	475	1	24	3	1	1	2	
5	1	1	73	131	72	16	BUL ELEC	155	4	1	5000	14	7	67	75	25	15	8	1	1	1	1	1	24	475	1	24	3	1	1	2	
5	1	1	73	131	72	16	PONT GRAY	455	4	1	4500	11	0	57	78	25	15	8	1	1	1	1	1	24	450	1	24	3	1	1	2	
5	1	1	73	131	72	16	DODG DART	225	1	1	3000	13	3	52	80	25	15	8	1	1	1	1	1	24	450	1	24	3	1	1	2	
5	1	1	73	131	72	16	CHEV IMPA	400	2	1	4500	11	0	59	74	28	15	8	1	1	1	1	1	24	450	1	24	3	1	1	2	
5	1	1	73	131	72	16	PLYM SATE	318	2	1	3500	11	2	62	73	28	15	8	1	1	1	1	1	24	450	1	24	3	1	1	2	
5	1	1	73	131	72	16	CHEV MUST	282	2	1	3500	12	3	51	74	28	00	8	1	1	1	1	1	30	550	1	30	0	1	2	2	
5	1	1	73	131	72	16	FORD MUST	289	2	1	3000	10	3	58	76	29	00	8	1	1	1	1	1	31	550	1	31	0	2	2	2	
5	1	1	73	131	72	16	CHEV CAMA	327	2	1	3500	12	3	58	76	29	05	8	1	1	1	1	1	28	435	1	28	4	1	2	2	
5	1	1	73	131	72	16	DODG DART	225	1	1	3000	10	3	58	76	29	05	8	1	1	1	1	1	28	435	1	28	4	1	2	2	
5	1	1	73	131	72	16	BUIC ELEC	430	4	1	4500	14	0	61	78	29	13	8	1	1	1	1	1	32	525	1	32	0	1	2	2	
5	1	1	73	131	72	16	VOLK BEET	78	1	4	2000	8	3	63	80	29	25	4	2	2	1	1	1	48	1200	2	48	0	2	2	2	
5	1	1	73	131	72	16	DODG POLA	318	2	1	4500	12	7	55	71	25	44	8	1	1	1	1	1	30	900	2	30	0	2	2	2	
5	1	1	73	131	72	16	CHEV IMPA	396	4	1	4500	14	0	55	71	29	44	8	1	1	1	1	1	32	500	1	32	0	1	2	2	
5	1	1	73	131	72	16	MERC MONR	351	2	1	5000	14	7	58	71	25	38	8	1	1	1	1	1	29	575	1	29	0	1	2	2	
5	1	1	73	131	72	16	CHEV IMPA	283	2	1	3500	11	2	53	71	29	40	8	1	1	1	1	1	28	500	1	28	0	2	2	2	
5	1	1	73	131	72	16	MERC COU	351	2	1	3500	12	3	58	71	29	40	8	1	1	1	1	1	29	575	1	29	0	1	2	2	
5	1	1	73	131	72	16	FORD COU	429	4	1	4500	14	0	55	73	29	50	8	1	1	1	1	1	26	1100	1	26	10	1	2	2	
5	1	1	73	131	72	16	RAMB AMBA	290	2	1	3500	12	3	55	84	29	45	8	1	1	1	1	1	30	500	1	30	0	1	2	2	
5	1	1	73	131	72	16	CADI FLEE	472	4	1	3500	12	3	53	68	29	45	8	1	1	1	1	1	30	500	1	30	0	1	2	2	
5	1	1	73	131	72	16	BUIC SKYL	350	2	1	4000	13	2	50	68	29	60	8	1	1	1	1	1	26	1100	1	26	10	1	2	2	
5	1	1	73	131	72	16	VOLK BEET	91	1	4	2250	8	6	60	76	29	50	4	2	1	1	1	1	30	700	1	30	0	1	2	2	
5	1	1	73	131	72	16	CADI FLEE	472	4	1	3500	13	3	60	68	29	60	8	1	1	1	1	1	30	700	1	30	0	1	2	2	
5	1	1	73	131	72	16	CADI FLEE	472	4	1	3500	13	3	60	68	29	60	8	1	1	1	1	1	30	700	1	30	0	1	2	2	
5	1	1	73	131	72	16	LINC CONT	460	4	1	5000	14	7	58	73	29	65	8	1	1	1	1	1	29	650	1	29	0	1	2	2	
5	1	1	73	131	72	16	TOYO CORO	120	2	1	2500	9	4	58	73	29	65	4	2	1	1	1	1	32	650	1	32	0	1	2	2	
5	1	1	73	131	72	16	CHEV BELA	283	2	3	4000	12	0	58	73	29	65	8	1	1	1	1	1	32	650	1	32	0	1	2	2	
5	1	1	73	131	72	16	DATS 510	97	1	1	2250	8	8	53	73	29	60	4	2	1	1	1	1	30	700	1	30	0	1	2	2	
5	1	1	73	131	72	16	FORD COU	390	2	1	4500	12	7	60	68	29	60	8	1	1	1	1	1	30	700	1	30	0	1	2	2	
5	1	1	73	131	72	16	PONT GTD	369	4	3	4000	12	0	56	77	29	60	8	1	1	1	1	1	30	700	1	30	0	1	2	2	
5	1	1	73	131	72	16	CHRY NEW	383	2	1	4500	14	0	59	80	29	35	8	1	1	1	1	1	30	700	1	30	0	1	2	2	
5	1	1	73	131	72	16	VOLK BEET	97	1	4	2250	8	8	54	76	29	40	4	2	1	1	1	1	29	650	1	29	0	1	2	2	
5	1	1	73	131	72	16	OLDS VIST	330	2	1	4000	13	2	64	84	29	25	8	1	1	1	1	1	29	650	1	29	0	1	2	2	
5	1	1	73	131	72	16	BUIC LESA	350	4	1	4500	14	0	58	80	25	25	8	1	1	1	1	1	35	575	1	35	12	1	2	2	
5	1	1	73	131	72	16	CHEV BELA	283	2	1	4000	12	0	60	79	29	20	8	1	1	1	1	1	32	525	1	32	0	1	2	2	
5	1	1	73	131	72	16	FORD COU	390	2	1	4500	12	7	59	73	29	19	8	1	1	1	1	1	31	500	1	31	12	1	2	2	
5	1	1	73	131	72	16	PONT EXEC	400	2	1	4500	14	0	61	86	29	20	8	1	1	1	1	1	31	500	1	31	12	1	2	2	
5	1	1	73	131	72	16	PONT CAT	400	2	1	4000	13	2	55	71	28	45	8	1	1	1	1	1	24	450	1	24	14	1	2	2	
5	1	1	73	131	72	16	DODG CORO	383	2	1	4000	13	2	58	77	29	50	8	1	1	1	1	1	29	570	1	29	12	1	2	2	
5	1	1	73	131	72	16	PLYM BELV	273	2	1	3500	11	2	58	74	29	50	8	1	1	1	1	1	29	570	1	29	12	1	2	2	
5	1	1	73	131	72	16	FORD MUST	289	4	1	3000	10	3	59	74	29	50	8	1	1	1	1	1	35	700	1	35	0	1	2	2	
5	1	1	73	131	72	16	PLYM FURY	318	2	1	4000	12	0	56	70	29	78	8	1	1	1	1	1	35	700	1	35	0	1	2	2	
5	1	1	73	131	72	16	OLDS DELM	350	2	1	4500	14	0	53	70	25	78	8	1	1	1	1	1	31	500	1	31	12	1	2	2	
5	1	1	73	131	72	16	CHEV CAPR	327	2	1	4000	12	0	58	73	29	78	8	1	1	1	1	1	30	625	1	30	25	1	2	2	
5	1	1	73	131	72	16	FORD FALC	200	1	1	3000	10	3	60	79	29	60	6	2	2	1	1	1	30	625	1	30	25	1	2	2	
5	1	1	73	131	72	16	CHEV IMPA	327	2	1	4500	14	0	58	73	29	63	8	1	1	1	1	1	35	700	1	35	0	2	2	2	
5	1	1	73	131	72	16	MERC COME	289	2	1	3500	11	2	53	76	29	40	8	1	1	1	1	1	33	700	1	33	0	2	2	2	
5	1	1	73	131	72	16	MERC COME	289	2	1	3500	11	2	53	76	29	40	8	1	1	1	1	1	33	700	1	33	0	2	2	2	
5	1	1	73	131	72	16	FORD MUST	351	2	1	3500	12	3	56	73	29	65	8	1	1	1	1	1	32	650	1	32	0	2	2	2	

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TABLE 1-
VEHICLE INFORMATION SUMMARY
ST 10012

CAP	DATE	BR	MO	YR	INPT	VE	WB	DB	EL	BM	Y	C	A	E	F	ODOM	FT	IPPM	N	DWL	IGNT	L	E
51	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	11382	24	675	1	12	0	1	1
52	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	6588	20	525	1	31	0	1	1
53	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	9723	16	525	1	31	0	1	1
54	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	87700	20	525	1	31	0	1	1
55	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	50246	20	525	1	31	0	1	1
56	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	32840	16	575	1	31	0	1	1
57	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	12700	11	700	1	31	0	1	1
58	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73885	11	525	1	31	0	1	1
59	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	69241	19	700	1	31	0	1	1
60	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	43866	19	700	1	31	0	1	1
61	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	57343	24	575	1	31	0	1	1
62	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	38928	20	500	1	31	0	1	1
63	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	63000	16	400	1	25	0	1	1
64	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	26648	24	600	1	23	0	1	1
65	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	44088	20	600	1	28	0	1	1
66	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	42730	20	600	1	28	0	1	1
67	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73390	24	600	1	30	0	1	1
68	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	48494	24	525	1	31	0	1	1
69	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	8365	11	475	1	31	0	1	1
70	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	51976	19	620	1	38	0	1	1
71	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	57088	24	500	1	30	0	1	1
72	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	57103	24	500	1	30	0	1	1
73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	30188	24	700	1	30	0	1	1
74	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	55655	19	600	1	37	0	1	1
75	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	40891	24	500	1	30	0	1	1
76	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	24912	10	1000	2	52	0	1	1
77	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	59444	10	1000	2	52	0	1	1
78	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	56321	24	700	1	25	0	1	1
79	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	56337	24	700	1	25	0	1	1
80	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	67434	19	600	1	37	0	1	1
81	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	19500	24	650	1	29	0	1	1
82	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	35711	18	650	1	30	0	1	1
83	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	81200	24	700	1	29	0	1	1
84	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	12320	24	600	1	30	0	1	1
85	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	42075	22	600	1	29	0	1	1
86	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	53418	22	700	1	28	0	1	1
87	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	34811	19	500	1	28	0	1	1
88	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	40378	20	600	1	28	0	1	1
89	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	40396	20	600	1	28	0	1	1
90	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	47523	10	1200	2	57	0	1	1
91	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	18986	15	750	2	10	0	1	1
92	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	100884	22	900	1	35	0	1	1
93	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	35873	20	600	1	29	0	1	1
94	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	94500	25	700	1	29	0	1	1
95	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	40679	18	550	1	30	0	1	1
96	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	40000	22	600	1	17	0	1	1
97	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	7471	16	700	1	29	0	1	1
98	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	97000	25	600	1	29	0	1	1
99	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	23788	25	575	1	13	0	1	1

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TABLE 1
VEHICLE INFORMATION SUMMARY
ST. LOUIS

S	C	CAP	R	PUR	DATE	YR	CD	MAKE	MOD	VID	V	INNT	HP	MS	DB	BARM	Y	C	V	X	C	A	E	E	P	D	IRPM	N	DWL	IGNT	LE	
5	1	107	141	141	73	3	9	72	3	FORD	FINI	122	1	1	2500	4	50	75	2	30	4	2	1	1	1	1	900	1	4	12	2	2
5	1	108	145	145	73	3	9	70	4	OLDS	DEL	350	2	1	4500	14	0	62	75	26	30	8	1	2	1	1	600	1	29	4	1	2
5	1	109	144	144	73	3	9	70	1	BUIC	SVL	350	2	1	3500	12	3	58	73	28	35	8	1	2	1	1	600	1	21	8	1	2
5	1	110	147	147	73	3	9	71	15	TOYO	CORU	71	1	4	2000	8	3	61	76	29	25	4	2	1	1	900	2	49	0	2	2	
5	1	111	151	151	73	3	12	69	1	TOYO	CORU	71	1	4	2000	8	3	61	76	29	25	4	2	1	1	900	2	49	0	2	2	
5	1	112	154	154	73	3	12	69	6	FORD	FAIR	240	1	3	3500	11	2	60	72	28	45	6	2	1	1	800	2	37	8	2	2	
5	1	113	153	153	73	3	12	69	6	FORD	TORI	200	1	1	3500	11	2	60	70	28	45	6	2	1	1	700	1	38	10	3	2	
5	1	114	152	152	73	3	12	72	4	OLDS	DEL	350	2	1	4500	14	0	62	75	29	45	8	1	1	1	800	1	28	4	1	2	
5	1	115	155	155	73	3	12	70	3	FORD	MAVE	302	2	1	3000	10	3	61	74	26	45	8	1	1	1	600	1	29	8	1	2	
5	1	116	156	156	73	3	12	70	3	CHEV	NOVA	230	2	1	3000	10	3	60	72	29	45	6	2	1	1	625	1	32	4	2	2	
5	1	117	157	157	73	3	12	70	3	CHRY	NEW	440	4	1	5000	14	7	61	73	29	40	8	1	1	1	500	1	31	-6	1	2	
5	1	118	158	158	73	3	13	72	3	CHEV	CAPR	350	2	1	4000	13	2	65	72	29	25	8	1	2	1	600	1	28	1	1	2	
5	1	119	162	162	73	3	13	70	4	OLDS	DEL	455	2	1	4500	14	0	66	73	29	22	8	1	1	1	8553	24	900	1	29	4	1
5	1	120	163	163	73	3	13	70	4	OLDS	DEL	455	2	1	4500	14	0	66	73	29	22	8	1	1	1	8553	24	900	1	29	4	1
5	1	121	164	164	73	3	13	70	6	FORD	MAVE	200	1	1	2750	9	9	66	72	28	00	6	2	1	1	800	1	27	4	2	2	
5	1	122	165	165	73	3	14	71	12	FORD	RANC	351	2	1	4500	14	0	66	73	29	00	8	1	1	1	900	1	30	3	1	2	
5	1	123	166	166	73	3	14	71	12	PLYM	FURY	360	2	1	4000	12	2	65	75	26	00	8	1	1	1	900	1	30	3	1	2	
5	1	124	167	167	73	3	14	71	6	FORD	TORI	302	2	1	3500	12	3	64	74	28	90	8	1	1	1	625	1	29	7	1	2	
5	1	125	168	168	73	3	14	72	15	VOLK	SCUA	97	1	1	2500	9	4	64	74	28	90	4	2	1	1	900	1	48	5	2	2	
5	1	126	169	169	73	3	14	72	6	FORD	GALA	429	4	1	4000	13	2	62	72	28	90	8	1	1	1	900	1	30	8	1	2	
5	1	127	170	170	73	3	14	72	5	PONT	CATA	400	2	1	4500	14	0	70	72	28	75	8	1	1	1	900	1	31	9	1	2	
5	1	128	171	171	73	3	14	71	1	BUIC	LESA	350	2	1	4500	14	0	60	72	28	75	8	1	1	1	600	1	29	6	1	2	
5	1	129	172	172	73	3	14	71	3	CHEV	IMPA	307	2	1	4500	12	7	61	72	28	95	8	1	1	1	600	1	29	7	1	2	
5	1	130	181	181	73	3	15	68	2	CADI	ELDO	472	4	1	5000	14	7	61	72	29	10	8	1	1	1	600	1	29	7	1	2	
5	1	131	182	182	73	3	15	71	10	DODG	DART	225	1	1	3000	10	3	60	72	29	10	6	2	1	1	850	1	29	5	2	2	
5	1	132	183	183	73	3	15	71	10	DODG	DART	225	1	1	3000	10	3	60	72	29	10	6	2	1	1	850	1	29	5	2	2	
5	1	133	184	184	73	3	15	71	3	CHEV	MALI	307	2	1	3500	11	2	65	73	29	05	8	1	1	1	650	1	27	6	1	2	
5	1	134	185	185	73	3	15	71	10	DODG	CHAR	383	4	1	4000	13	2	64	73	28	10	8	1	1	1	600	1	31	6	1	2	
5	1	135	186	186	73	3	15	71	12	PLYM	SATE	318	2	1	3500	12	3	58	73	29	10	8	1	1	1	650	1	29	5	1	2	
5	1	136	187	187	73	3	15	72	12	PLYM	DUST	225	1	1	3000	10	3	62	72	29	10	6	1	1	1	700	1	27	4	2	2	
5	1	137	188	188	73	3	15	72	12	PLYM	VALI	340	4	1	3500	12	3	60	72	29	05	8	1	1	1	650	1	27	4	2	2	
5	1	138	189	189	73	3	15	72	12	PLYM	VALI	340	4	1	3500	12	3	60	72	29	05	8	1	1	1	650	1	27	4	2	2	
5	1	139	190	190	73	3	15	72	10	DODG	DART	318	2	1	3000	10	3	62	72	29	12	8	1	1	1	725	1	27	4	2	2	
5	1	140	191	191	73	3	16	67	3	CHEV	CAME	230	1	1	3000	10	3	65	74	28	90	6	2	2	1	950	2	29	3	2	2	
5	1	141	192	192	73	3	16	67	6	FORD	FAIR	302	2	1	3500	11	2	67	74	29	00	8	1	1	1	850	1	30	6	2	2	
5	1	142	193	193	73	3	16	69	6	FORD	LTD	400	2	1	4000	13	2	62	74	28	10	8	1	1	1	600	1	31	5	1	2	
5	1	143	194	194	73	3	16	71	6	FORD	LTD	400	2	1	4000	13	2	62	74	28	10	8	1	1	1	600	1	31	5	1	2	
5	1	144	195	195	73	3	16	71	6	FORD	LTD	400	2	1	4000	13	2	62	74	28	10	8	1	1	1	600	1	31	5	1	2	
5	1	145	196	196	73	3	16	71	6	FORD	LTD	400	2	1	4000	13	2	62	74	28	10	8	1	1	1	600	1	31	5	1	2	
5	1	146	197	197	73	3	16	71	17	OPEL	WAGO	36	1	1	2250	8	8	56	73	29	15	4	1	1	1	600	1	27	3	2	2	
5	1	147	198	198	73	3	16	71	4	FORD	COUN	351	2	1	4500	14	0	60	76	29	30	8	1	1	1	600	1	27	3	3	1	
5	1	148	199	199	73	3	16	72	5	FORD	GALA	400	2	1	4000	13	2	60	76	29	30	8	1	1	1	600	1	27	3	3	1	
5	1	149	200	200	73	3	16	72	5	FORD	GALA	400	2	1	4000	13	2	60	76	29	30	8	1	1	1	600	1	27	3	3	1	
5	1	150	201	201	73	3	16	72	5	FORD	GALA	400	2	1	4000	13	2	60	76	29	30	8	1	1	1	600	1	27	3	3	1	
5	1	151	202	202	73	3	16	72	5	CHEV	MALI	350	4	1	3500	12	3	61	76	29	20	8	1	1	1	600	2	31	4	1	2	
5	1	152	203	203	73	3	16	72	5	CHEV	CAPR	400	2	1	4500	14	0	60	76	29	22	8	1	1	1	550	1	31	5	1	2	
5	1	153	204	204	73	3	16	72	5	CHEV	MALI	307	2	1	3500	12	3	60	74	29	20	8	1	1	1	500	1	29	5	1	2	
5	1	154	205	205	73	3	16	72	5	CHEV	MALI	307	2	1	3500	12	3	60	74	29	20	8	1	1	1	500	1	29	5	1	2	
5	1	155	206	206	73	3	16	72	5	CHEV	MALI	307	2	1	3500	12	3	60	74	29	20	8	1	1	1	500	1	29	5	1	2	
5	1	156	207	207	73	3	16	72	5	CHEV	MALI	307	2	1	3500	12	3	60	74	29	20	8	1	1	1	500	1	29	5	1	2	
5	1	157	208	208	73	3	16	72	5	CHEV	MALI	307	2	1	3500	12	3	60	74	29	20	8	1	1	1	500	1	29	5	1	2	
5	1	158	209	209	73	3	16	72	5	CHEV	MALI	307	2	1	3500	12	3	60	74	29	20	8	1	1	1	500	1	29	5	1	2	
5	1	159	210	210	73	3	16	72	5	CHEV	MALI	307	2	1	3500	12	3	60	74	29	20	8	1	1	1	500	1	29	5	1	2	
5	1	160	211	211	73	3	16	72	5	CHEV	MALI	307	2	1	3500	12	3	60	74	29	20	8	1	1	1	500	1	29	5	1	2	
5	1	161	212	212	73	3	16	72	5	CHEV	MALI	307	2	1	3500	12	3	60	74	29	20	8	1	1	1	500	1	29	5	1	2	

TABLE 12

VEHICLE INFORMATION SUMMARY

ST LOUIS

COF R	RUN DATE	YR	CD	MAKE	MOD	CID	V T	INRT	HP	WB	DB	B-H-M	C A	E R	D	IRPW	N	DWL	IONT	L E	D T
5 1 159	208 73 321	72	5	PONT	LEMA	350	2	1	4000	13	2	62 77 25 45	8	1	1	1	1	1	1	1	1
5 1 160	213 73 322	68	6	FORD	GALA	390	2	1	4000	13	2	61 77 29 50	8	1	1	1	1	1	1	1	1
5 1 162	233 73 328	72	4	OLDS	CUTL	350	2	1	4000	13	2	66 78 26 15	8	1	1	1	1	1	1	1	1
5 1 164	253 73 4 3	71	1	BUIC	SKYL	350	2	1	4000	13	2	63 74 20 15	8	1	1	1	1	1	1	1	1
5 1 165	263 73 4 4	72	3	CHEV	NOVA	350	2	1	3500	11	2	61 73 20 14	8	1	1	1	1	1	1	1	1
5 1 166	266 73 4 5	72	3	CHEV	NOVA	350	2	1	3500	11	2	61 73 20 14	8	1	1	1	1	1	1	1	1
5 1 167	269 73 4 5	70	6	FORD	MAVE	250	1	1	3000	10	3	50 72 20 37	8	1	1	1	1	1	1	1	1
5 1 168	273 73 4 6	70	6	FORD	MAVE	250	1	1	3000	10	3	50 72 20 37	8	1	1	1	1	1	1	1	1
5 1 169	285 73 410	70	3	CHEV	KING	350	2	1	4500	12	7	61 79 20 40	8	1	1	1	1	1	1	1	1
5 1 170	291 73 411	70	15	TOYO	CORO	113	2	4	2500	9	4	61 74 20 55	4	1	1	1	1	1	1	1	1
5 1 171	300 73 413	71	3	CHEV	VEGA	140	1	1	2500	9	4	60 70 20 50	4	1	1	1	1	1	1	1	1
5 1 172	305 73 417	71	3	CHEV	NOVA	307	2	1	3500	12	3	67 70 20 30	8	1	1	1	1	1	1	1	1
5 1 173	308 73 5 4	72	6	FORD	GALA	351	2	1	4000	13	2	69 70 20 40	8	1	1	1	1	1	1	1	1
5 1 174	309 73 5 4	71	14	DATS	WAGO	97	2	4	2500	9	4	57 70 20 55	4	1	1	1	1	1	1	1	1
5 1 175	307 73 5 5	67	6	FORD	MUST	289	2	1	3000	10	3	73 80 20 35	8	1	1	1	1	1	1	1	1
5 1 176	302 73 5 4	66	5	PONT	TEMP	326	2	3	3500	11	2	60 80 20 45	8	1	1	1	1	1	1	1	1
5 1 177	304 73 5 5	70	6	FORD	FALC	302	2	1	4000	13	2	63 70 20 47	8	1	1	1	1	1	1	1	1
5 1 178	305 73 5 5	70	5	PONT	CATA	350	2	1	4500	14	0	64 70 20 45	8	1	1	1	1	1	1	1	1
5 1 179	418 73 5 9	70	1	BUIC	ESTA	455	4	1	5000	13	4	65 70 20 15	8	1	1	1	1	1	1	1	1
5 1 180	417 73 5 9	72	6	FORD	GALA	351	2	1	4500	12	7	66 70 20 15	8	1	1	1	1	1	1	1	1
5 1 181	412 73 5 9	68	5	PONT	LEMA	350	2	1	4000	12	0	64 70 20 20	8	1	1	1	1	1	1	1	1
5 1 182	413 73 5 9	67	5	PONT	LEMA	326	2	1	3500	11	2	65 70 20 20	8	1	1	1	1	1	1	1	1
5 1 183	414 73 5 9	67	8	MERC	HONR	390	4	1	4000	12	0	66 70 20 20	8	1	1	1	1	1	1	1	1
5 1 184	419 73 510	66	12	PLYM	VALI	225	1	1	3000	10	3	67 70 20 20	8	1	1	1	1	1	1	1	1
5 1 185	423 73 512	72	3	CHEV	IMPA	454	4	1	4500	12	7	62 70 20 20	8	1	1	1	1	1	1	1	1
5 1 186	424 73 511	71	4	OLDS	CUTL	350	2	1	4000	13	2	62 70 20 20	8	1	1	1	1	1	1	1	1
5 1 187	428 73 512	71	5	PONT	LEMA	350	2	1	4000	13	2	63 70 20 20	8	1	1	1	1	1	1	1	1
5 1 188	447 73 518	67	1	BUIC	LESA	340	4	1	4500	14	0	61 70 20 18	8	1	1	1	1	1	1	1	1
5 1 189	492 73 531	71	3	CHEV	CAPR	402	4	1	4500	14	0	62 70 20 20	8	1	1	1	1	1	1	1	1

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3.2 VEHICLE EXHAUST EMISSIONS RESULTS

Vehicle exhaust emissions results, Tables 13A and 13B, list exhaust emissions test results in grams per mile for hydrocarbons, carbon monoxide, carbon dioxide, nitric oxide, nitrogen dioxide, total oxides of nitrogen and total oxides of nitrogen corrected for humidity.

3-14
TABLE 13A

EXHAUST EMISSION TEST RESULTS IN PPM PER MILE

LOS ANGELES

1972 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
1	70	FORD	250	4.65	60.60	421.84	4.73	2.13	6.86	6.37	7.00	16.7
2	70	VOLK	97	3.52	37.14	327.45	3.31	0.67	3.98	3.80	2.75	22.4
3	70	CHEV	307	3.75	46.42	621.30	4.18	1.48	5.66	5.30	1.00	12.6
4	68	CHEV	327	8.93	104.04	508.76	3.46	0.97	4.43	4.27	0.80	12.7
5	70	BUIC	455	6.30	116.36	642.11	3.63	1.26	4.89	4.50	2.50	10.5
6	66	RAMB	232	3.25	85.22	411.52	2.40	0.54	2.94	2.78	3.00	18.0
7	72	FORD	302	2.86	39.03	734.13	3.11	0.63	3.74	3.67	1.75	11.0
8	72	OLDS	350	4.13	60.37	742.27	2.90	0.94	3.84	3.79	1.50	10.4
9	72	FORD	400	2.52	47.94	872.96	3.84	1.35	5.19	5.07	0.10	9.3
10	70	CHEV	307	5.47	86.34	546.80	3.35	0.73	4.08	3.86	5.00	12.7
11	66	CHEV	327	6.62	107.36	548.28	3.28	1.26	4.54	4.53	5.50	12.0
12	72	DATS	72	3.09	27.02	285.27	2.49	0.45	2.94	2.96	3.20	26.3
13	66	CHEV	327	10.29	161.18	466.55	1.92	0.40	2.32	2.26	6.20	11.8
15	67	BUIC	340	2.55	58.83	563.84	1.44	0.19	1.63	1.54	1.50	13.4
16	72	FORD	122	3.62	31.50	357.37	3.04	0.96	4.00	3.81	2.50	21.2
18	68	DODG	383	6.28	108.43	596.98	2.46	0.75	3.21	2.88	0.80	11.3
19	71	FORD	429	5.87	82.50	652.89	3.65	1.10	4.75	4.19	6.50	11.1
20	69	BUIC	350	4.07	72.52	571.89	4.32	1.10	5.42	5.26	3.50	12.7
21	70	CHEV	350	2.93	28.84	668.51	3.54	0.94	4.48	4.34	0.50	12.3
22	66	CHEV	283	3.48	26.26	536.88	3.89	1.72	5.61	5.72	2.40	15.1
23	71	MERC	302	3.97	76.61	683.68	2.21	0.39	2.60	2.65	5.50	10.9
24	72	PLYM	318	4.61	109.09	551.79	2.03	0.33	2.36	2.33	8.00	12.0
25	68	PONT	400	2.99	49.35	771.96	2.95	0.94	3.89	3.70	0.80	10.3
26	72	DODG	360	7.95	121.51	628.15	2.48	0.65	3.13	3.00	6.50	10.5
27	68	CHEV	327	8.72	69.17	547.01	4.74	2.33	7.07	7.23	6.50	13.0
28	72	FORD	302	4.48	80.14	653.12	2.95	1.00	3.95	3.88	5.80	11.2
29	69	FORD	302	7.60	81.13	542.25	6.33	2.72	9.05	9.64	6.50	12.8
30	71	CHEV	140	2.98	48.26	384.25	3.06	0.66	3.72	3.54	0.80	18.9
30R	71	CHEV	140	2.95	50.76	380.34	2.88	0.69	3.57	3.76	0.80	18.9
31	68	FORD	200	3.34	38.23	543.06	4.98	2.67	7.65	7.62	2.20	14.5
32	71	FORD	351	2.78	70.63	332.67	2.63	0.65	3.28	3.29	9.00	19.6
33	69	FORD	390	4.12	25.77	658.60	5.26	2.25	7.51	7.32	0.02	12.5
34	69	CADT	472	0.99	38.59	1198.15	3.54	0.88	4.42	4.53	0.25	7.0
35	70	MERC	351	9.00	136.42	611.99	4.31	1.51	5.82	5.95	10.00	10.4
36	66	FORD	289	3.72	41.77	527.07	1.82	0.48	2.30	2.21	1.60	14.7
37	68	VOLK	91	5.38	104.27	268.47	1.59	0.23	1.82	1.67	6.80	19.7
38	71	DATS	146	5.36	47.33	418.42	2.63	0.63	3.26	3.18	2.50	17.4
39	71	PONT	400	5.32	82.92	764.50	3.36	0.70	4.06	4.00	0.20	9.7
40	67	PONT	326	4.25	57.21	724.63	2.61	0.50	3.11	3.02	4.00	10.7
41	70	FORD	250	3.25	57.52	441.30	2.35	0.39	2.74	2.63	2.10	16.4
42	67	CHEV	250	1.47	23.89	733.32	3.13	0.61	3.74	3.60	1.90	11.4
42R	67	CHEV	250	1.19	25.08	533.25	2.49	0.48	2.97	2.79	1.90	15.4
43	66	PONT	309	4.39	83.94	515.34	2.90	0.74	3.64	3.30	2.25	13.4
44	71	PLYM	318	3.74	79.38	457.17	2.35	0.67	3.02	2.79	6.00	14.9
45	70	FORD	351	4.19	91.09	727.98	2.10	0.32	2.42	2.50	0.50	10.0
45R	70	FORD	351	3.66	90.24	703.63	1.91	0.35	2.26	2.25	0.50	10.6
46	71	FORD	250	3.21	51.83	542.57	2.40	0.60	3.00	2.72	3.50	14.0
47	69	MERC	390	7.64	126.70	670.49	3.61	1.21	4.82	4.93	6.80	9.9
48	69	CHEV	350	6.36	75.27	494.96	3.27	0.89	4.16	3.87	7.50	14.0
49	69	FORD	390	5.55	125.21	545.12	3.66	1.12	4.78	4.64	7.30	11.4

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TABLE 23A

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

LOS ANGELES

1972 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
50	67	FORD	289	3.51	50.78	401.71	2.50	0.41	3.11	3.02	0.66	18.0
51	68	BUIC	350	24.68	37.05	598.98	4.04	1.45	5.49	5.74	0.10	11.4
52	67	MERC	410	8.96	135.14	646.95	2.74	0.76	3.50	3.34	4.00	10.0
53	68	PONT	350	7.12	94.11	586.54	3.99	2.30	6.29	6.00	6.80	11.7
54	71	CHEV	350	3.96	69.13	731.79	3.30	0.84	4.14	4.02	1.25	10.4
55	71	DODG	318	4.19	99.38	533.90	2.45	0.70	3.15	3.26	7.80	12.6
57	66	FORD	200	4.62	131.13	412.97	1.22	0.16	1.38	1.29	10.00	14.0
58	70	FORD	202	5.66	89.05	539.31	3.54	1.42	4.96	4.53	7.00	12.7
59	66	VOLK	70	51.13	178.98	174.55	0.47	0.05	0.52	0.52	4.00	14.4
60	69	PONT	400	4.76	79.55	680.25	3.42	0.82	4.24	4.05	4.20	10.8
61	70	FORD	351	1.09	56.15	689.27	4.81	1.96	6.77	6.46	0.15	11.2
62	71	CHEV	350	3.24	49.79	679.00	3.14	1.01	4.15	4.14	0.10	11.6
62R	71	CHEV	350	3.46	41.79	705.57	3.20	0.98	4.18	4.08	0.10	11.3
63	70	CHEV	402	18.93	172.57	599.04	1.20	0.14	1.34	1.33	5.00	9.5
64	70	PONT	350	5.13	81.38	627.13	3.64	1.02	4.66	4.33	1.80	11.5
65	66	PLYM	225	7.23	139.91	395.63	2.42	0.87	3.27	3.16	10.30	13.9
67	70	CHEV	307	6.19	62.86	470.26	4.50	2.24	6.74	6.07	6.00	15.1
68	70	OLDS	350	4.57	65.83	660.30	3.31	0.71	4.02	3.90	5.50	11.1
69	69	FORD	302	4.92	56.55	536.48	6.38	3.62	10.00	9.00	2.00	13.8
70	69	PONT	400	4.85	90.74	618.08	3.92	0.76	4.68	4.64	5.50	11.4
71	69	OLDS	350	3.96	62.14	680.67	3.27	0.66	3.93	3.86	4.30	11.2
72	69	CHEV	230	6.88	77.50	383.32	3.22	0.88	4.10	3.85	0.40	16.8
73	71	TOYO	113	2.50	37.56	358.38	3.58	1.18	4.76	4.82	1.60	20.9
74	66	PONT	389	4.28	52.93	617.05	5.77	2.37	8.14	7.93	4.40	12.4
75	71	FORD	351	3.72	46.25	620.47	3.20	0.87	4.07	3.78	1.10	12.6
76	71	VOLK	97	6.72	61.17	404.11	3.11	0.78	3.89	3.92	2.00	17.0
77	69	PLYM	318	5.04	37.52	523.35	4.93	1.67	6.60	6.29	0.05	14.8
78	71	BUIC	455	3.31	65.63	805.60	4.20	1.46	5.66	5.18	3.00	9.7
79	69	OLDS	455	3.57	58.67	624.81	4.04	1.20	5.24	4.83	2.50	12.2
80	72	FORD	429	3.77	104.15	722.23	2.44	0.53	2.97	2.77	5.00	9.9
81	70	AMER	304	4.28	74.54	590.82	2.86	0.44	3.30	3.14	2.00	12.3
82	72	BUIC	350	1.94	34.35	632.45	3.24	1.41	4.65	4.17	2.50	12.8
83	68	FORD	390	5.15	82.59	527.91	3.63	0.83	4.46	3.79	5.20	13.2
84	70	DODG	225	3.41	62.39	380.18	4.89	2.25	7.14	6.50	2.50	18.1
86	66	BUIC	340	4.89	105.84	472.63	0.77	0.15	0.92	0.80	3.00	13.6
87	71	CHEV	350	4.92	63.62	605.66	4.70	1.74	6.44	5.62	3.40	12.3
88	68	OLDS	455	5.67	66.12	588.24	4.76	2.16	6.92	6.60	5.20	13.0
89	70	BUIC	455	6.61	113.24	577.40	4.48	2.01	6.49	6.07	5.20	11.4
90	71	VOLK	88	5.32	58.47	282.54	2.44	0.81	3.25	2.99	3.20	22.7
91	70	PLYM	389	6.13	85.42	570.63	4.06	0.97	5.03	5.02	6.80	12.3
92	67	OLDS	425	5.15	64.31	604.59	3.92	1.08	5.00	4.87	6.40	12.3
93	70	FORD	390	5.37	22.70	527.31	3.53	0.77	4.30	4.19	0.40	15.3
94	71	PLYM	225	6.22	114.61	335.70	1.53	0.28	1.81	1.84	0.80	16.6
95	67	VOLK	91	20.61	114.87	200.00	1.49	0.11	1.58	1.52	2.40	19.9
96	68	MERC	302	20.13	67.90	539.45	2.27	0.59	2.86	2.43	0.80	12.5
97	69	BUIC	430	2.36	63.47	774.94	3.85	0.84	4.69	4.36	2.60	10.1
98	69	VOLK	97	8.25	88.63	818.39	2.07	0.29	2.36	2.27	4.80	18.7
99	71	FORD	98	7.90	30.49	311.92	2.59	0.63	3.22	2.85	0.20	23.1
100	70	CHRY	440	9.95	132.82	607.58	4.05	1.41	5.46	5.10	4.80	10.5
101	69	CHEV	327	28.98	166.27	398.37	2.92	0.78	3.70	3.48	10.00	11.8

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TABLE 13A

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

LOS ANGELES

1972 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
102	68	CHRY	383	8.82	131.25	545.81	4.09	1.42	5.51	5.15	8.20	11.4
103	69	FORD	302	4.07	82.52	449.21	3.21	0.63	3.84	3.62	2.60	16.0
104	68	CHEV	307	8.45	141.56	462.58	3.39	0.79	4.10	3.99	5.20	12.5
105	71	LINC	460	4.15	68.86	776.35	4.17	1.67	5.84	5.86	1.75	9.9
106	68	FORD	289	13.08	39.90	487.79	4.60	1.85	6.45	6.02	6.00	15.0
107	67	PLYM	318	9.88	185.99	445.96	1.00	0.09	1.09	1.01	4.00	11.6
108	72	CHEV	400	1.97	26.73	847.24	3.02	0.51	3.53	3.37	2.10	9.9
109	72	FORD	351	4.40	84.94	693.74	3.36	0.71	4.07	3.83	3.60	10.6
110	70	FORD	302	11.35	159.86	525.66	2.04	0.14	2.18	2.03	5.00	10.9
111	70	PLYM	318	4.89	78.47	557.25	5.38	1.85	7.23	6.53	2.90	12.8
112	72	CHRY	400	3.93	88.90	685.07	4.31	1.13	5.44	5.43	5.50	10.6
113	67	CHEV	250	2.46	70.20	588.34	2.87	0.94	3.81	3.58	3.40	12.6
114	66	DODG	383	4.74	93.62	593.82	3.80	0.81	4.61	4.43	1.00	11.7
115	66	MERC	390	3.51	72.26	749.24	2.57	0.40	2.97	2.69	1.70	10.2
117	67	CHRY	383	13.55	203.72	582.35	1.91	0.32	2.23	2.13	4.00	9.4
118	68	CADI	472	3.60	75.47	770.58	5.09	1.73	6.82	7.07	0.10	9.9
119	66	OLDS	330	8.97	126.89	464.34	2.23	0.27	2.50	2.34	9.50	8
120	70	VOLK	7	3.07	35.35	305.49	2.83	0.47	3.30	3.15	0.20	12.1
122	72	CHEV	350	2.02	35.43	673.07	2.55	0.44	2.99	2.81	0.75	12.1
123	68	CHEV	307	5.19	67.70	536.94	3.01	0.58	3.59	3.10	2.80	13.5
124	72	CHEV	350	31.00	55.35	665.42	2.41	0.42	2.83	2.64	10.00	10.4
125	67	FORD	390	5.62	67.34	543.89	4.41	1.03	5.44	5.01	4.25	13.3
126	66	CADI	429	2.72	52.99	696.58	4.98	2.61	7.59	6.43	7.80	11.3
127	67	PONT	400	4.23	69.15	630.03	5.64	2.10	7.74	7.24	6.50	11.8
128	70	TOYO	116	4.02	96.04	377.48	2.48	0.94	3.42	3.11	0.40	16.4
129	67	CHEV	327	3.10	47.39	659.53	3.97	0.95	4.92	4.59	0.20	11.9
130	72	CHEV	350	1.30	19.00	767.48	2.10	0.34	2.44	2.27	0.10	11.1
131	67	FORD	289	4.66	109.60	509.14	1.89	0.26	2.15	1.89	2.40	12.7
132	69	PLYM	318	5.50	102.51	549.40	4.42	0.94	5.36	4.62	5.00	12.2
133	72	CHEV	140	2.70	41.40	419.98	2.11	0.33	2.44	2.49	2.50	16.7
134	67	CHEV	327	9.73	155.08	553.62	3.52	0.73	4.25	3.98	7.50	10.7
135	67	AMER	232	2.97	22.79	453.01	4.83	1.73	6.76	6.36	0.90	17.8
136	71	DODG	383	3.37	100.74	609.06	3.06	0.67	3.73	3.50	2.70	11.4
137	69	CHEV	307	6.35	130.47	462.19	2.55	0.43	2.98	2.79	6.00	12.9
138	68	CHEV	250	2.63	57.12	536.24	2.12	0.51	2.63	2.46	7.00	14.0
139	71	OPEL	116	7.11	71.92	338.67	4.42	1.06	5.48	5.19	10.00	18.7
140	72	OLDS	455	1.73	33.17	928.19	4.57	1.55	6.12	6.01	0.30	9.0
141	71	OLDS	455	2.78	62.65	852.22	4.06	1.13	5.19	4.92	2.60	9.2
142	71	BUIC	455	5.84	162.25	738.20	1.78	0.29	2.07	1.98	3.40	8.8
143	72	TOYO	120	3.72	46.94	347.10	3.43	0.88	4.31	4.20	4.10	20.5
144	69	PLYM	318	4.73	91.75	549.91	3.39	0.81	4.20	3.84	3.70	12.2
145	71	CHEV	350	9.86	69.01	634.23	2.64	0.36	3.00	2.92	0.80	11.5
146	72	CHEV	350	4.79	65.44	698.22	2.31	0.67	2.98	2.91	6.00	10.9
147	71	CHEV	350	3.41	7.17	616.94	2.97	0.55	3.52	3.41	0.80	12.9
148	67	CHEV	283	6.73	80.10	558.40	3.34	0.56	3.90	3.64	3.30	12.6
149	69	CHEV	327	11.31	102.95	593.66	4.02	1.16	5.18	4.95	3.60	11.2
149R	69	CHEV	327	3.99	76.25	649.81	3.12	0.47	3.59	3.54	3.60	11.0
150	68	RAMB	290	4.73	59.43	533.09	3.82	0.83	4.65	4.50	0.90	13.8
150R	68	RAMB	290	4.02	60.61	532.66	3.78	0.58	4.36	4.19	0.90	13.8
151	70	PONT	350	37.08	100.04	657.56	4.38	1.41	5.79	5.73	2.80	9.5

TABLE 13A

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

LOS ANGELES

1972 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
151R	70	PONT	350	36.17	99.59	647.11	4.24	1.24	5.48	5.35	2.80	9.6
152	71	OLDS	350	2.11	59.38	798.23	3.76	1.03	4.79	4.60	0.20	9.9
153	72	MERC	400	2.96	61.22	881.83	5.58	2.27	7.85	7.54	0.10	9.0
154	71	CHEV	400	2.98	50.23	777.64	3.89	0.86	4.75	4.60	0.15	10.2
155	71	PONT	350	5.02	105.27	674.68	2.93	0.36	3.29	3.18	3.00	10.4
156	72	AHER	258	1.84	27.77	528.61	3.80	1.02	4.82	4.70	0.70	15.4
157	66	CHEV	283	5.67	93.19	626.45	3.03	0.76	3.79	3.60	10.00	11.2
157R	66	CHEV	283	4.65	75.91	594.30	3.39	0.95	4.34	4.22	10.00	12.1
158	72	CHEV	350	2.56	52.23	721.41	2.45	0.48	2.93	2.83	4.20	10.9
159	71	FORD	351	4.11	58.43	573.09	3.60	0.94	4.54	4.43	2.70	13.1
160	72	DODG	225	2.35	71.83	563.72	2.82	0.50	3.32	3.25	5.20	13.0
161	67	DODG	225	4.01	63.42	451.45	4.60	1.58	6.18	5.97	1.20	15.7
162	72	PONT	350	3.10	46.01	721.95	3.32	0.76	4.08	4.00	0.60	11.0
163	72	CADI	472	1.14	34.92	1051.50	3.81	0.95	4.76	4.67	1.25	8.0
164	72	VOLK	97	2.63	44.23	364.89	2.29	0.29	2.58	2.54	0.65	20.0
165	72	PLYM	360	3.32	59.57	821.29	3.11	1.01	4.12	4.02	0.20	9.6
167	72	VOLK	102	2.34	34.98	424.03	2.59	0.58	3.17	3.05	0.40	18.2
168	72	BUIC	455	4.18	71.01	929.42	3.05	0.73	3.78	3.53	2.50	8.4
169	72	BUIC	455	3.10	26.84	891.38	3.84	1.20	5.04	4.72	3.20	9.4
169R	72	BUIC	455	2.65	20.93	864.31	3.78	1.12	4.90	4.78	0.20	9.8
170	72	PLYM	340	5.38	85.62	553.71	3.90	1.21	5.11	4.88	5.50	12.6
170R	72	PLYM	340	4.41	82.88	559.37	3.28	0.98	4.26	4.16	5.50	12.6
172	72	PONT	400	4.18	45.47	815.88	3.68	1.89	5.57	5.31	0.65	9.9
173	69	DODG	440	5.57	65.82	697.19	2.34	0.39	2.73	2.61	0.25	10.8
174	70	OLDS	350	5.91	104.88	609.64	3.75	1.19	4.94	4.79	6.00	11.2
175	69	FORD	250	2.95	45.52	479.86	5.29	2.00	7.29	7.12	1.60	15.8
176	70	DODG	440	18.30	202.92	578.62	2.46	0.60	3.06	3.03	8.90	9.3
177	66	FORD	390	5.87	126.34	837.64	3.18	0.66	3.84	3.91	5.00	8.4
178	72	CHEV	402	2.75	53.20	832.76	2.71	0.62	3.33	3.70	0.50	9.6
179	72	FORD	302	4.02	60.59	761.07	3.12	0.60	3.72	3.84	0.20	10.2

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TABLE 13A

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

ST LOUIS

1972 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
1	67	VOLK	91	5.85	49.41	296.99	1.56	0.10	1.66	1.54	1.20	22.6
2	72	CHEV	350	3.41	40.97	604.18	2.94	0.48	3.42	3.09	0.10	11.7
3	66	CADI	429	11.25	232.02	553.59	1.02	0.09	1.11	1.04	1.00	9.3
4	72	BUIC	455	1.99	18.11	786.79	5.49	1.70	7.19	7.71	1.20	10.8
5	71	PONT	455	4.15	22.04	676.92	5.44	1.58	7.02	5.98	0.10	12.2
6	72	DODG	225	2.66	36.17	453.06	4.22	0.98	5.20	4.79	0.50	17.1
7	72	CHRY	400	3.59	50.81	623.41	4.79	1.20	5.99	5.44	0.50	12.4
8	72	PLYM	318	2.83	14.00	559.70	3.97	0.69	4.66	4.52	0.10	15.0
9	67	CHEV	283	12.62	201.03	388.52	1.57	0.20	1.80	1.69	7.50	11.9
10	66	FORD	289	5.41	63.00	452.38	5.29	1.61	6.90	6.06	1.85	15.6
11	67	CHEV	327	7.11	66.21	439.32	2.84	0.50	3.34	3.05	0.30	15.7
12	67	DODG	225	5.01	97.92	321.21	2.15	0.21	2.36	2.11	7.10	18.1
14	69	BUIC	430	4.59	76.03	484.37	2.64	0.87	3.51	3.19	2.20	14.4
16	66	VOLK	78	6.12	72.83	227.16	0.99	0.09	1.08	1.01	5.20	24.6
17	70	DODG	318	8.22	38.42	628.22	4.87	1.07	5.94	5.10	0.50	12.4
18	69	CHEV	396	7.40	145.44	559.73	2.29	0.20	2.49	2.14	4.90	10.9
19	72	MERC	351	3.35	26.72	775.41	4.88	1.01	5.89	5.33	0.10	10.7
20	66	CHEV	283	7.80	58.36	598.19	2.66	0.44	3.10	2.67	2.10	12.4
21	70	MERC	351	4.36	27.38	585.73	3.22	0.50	3.72	3.36	1.65	13.8
22	69	FORD	429	3.31	31.14	392.96	2.94	0.47	3.41	2.83	4.00	19.6
23	68	RAMB	290	2.32	18.21	314.25	2.46	0.41	2.87	2.28	1.80	25.8
24	69	CADI	472	3.18	58.00	816.27	5.21	1.40	6.61	5.58	0.10	9.7
25	72	BUIC	350	4.60	49.14	709.69	4.70	1.43	6.13	5.20	0.50	11.1
26	68	VOLK	91	27.02	113.86	293.29	1.95	0.28	2.23	2.02	2.20	15.9
27	72	CADI	472	2.75	36.83	929.02	5.13	1.58	6.71	5.68	0.05	8.9
28	71	LINC	460	4.13	54.37	730.88	6.56	1.82	8.38	7.37	0.65	10.7
29	72	TOYO	120	3.21	32.86	391.07	3.64	1.19	4.83	4.24	3.20	19.6
30	66	CHEV	283	16.56	161.45	436.50	2.05	0.37	2.42	2.10	1.50	11.9
31	72	DATS	97	2.98	42.13	316.05	2.82	0.66	3.48	2.87	0.0	22.7
32	67	FORD	390	6.06	61.16	592.57	5.88	1.91	7.79	6.77	2.80	12.5
34	66	PONT	389	9.96	152.13	427.34	0.34	0.03	0.37	0.31	1.00	12.7
36	67	CHRY	383	10.05	219.77	439.97	1.35	0.13	1.48	1.28	4.60	10.9
37	72	VOLK	97	3.26	31.57	315.86	2.54	0.48	3.02	2.47	2.10	23.6
38	67	OLDS	330	8.31	129.95	721.09	3.27	1.02	4.29	4.00	4.00	9.3
39	68	BUIC	350	6.49	158.71	507.21	3.03	0.52	3.55	3.03	5.80	11.4
40	66	CHEV	283	8.16	73.72	478.81	4.28	1.10	5.38	4.79	1.50	14.3
41	66	FORD	390	7.36	98.60	349.46	2.83	0.62	3.45	3.15	3.80	16.2
44	67	PONT	400	11.62	160.25	576.77	2.39	0.25	2.64	2.38	3.80	10.3
45	68	PONT	400	6.49	127.43	572.34	4.75	1.35	6.10	5.29	8.20	11.3
46	66	DODG	383	5.26	49.57	706.98	3.39	0.92	4.31	3.74	5.80	10.9
47	67	PLYM	273	9.75	79.69	474.02	4.97	1.77	6.74	5.96	8.80	14.1
48	67	FORD	289	5.65	122.45	428.40	2.21	0.33	2.54	2.29	7.40	13.9
49	68	PLYM	318	3.58	27.73	521.93	4.54	1.75	6.31	5.53	0.25	15.4
50	68	OLDS	350	5.33	68.81	587.55	4.93	1.78	6.71	5.61	2.80	12.5
52	67	CHEV	327	9.86	163.34	479.46	3.80	1.03	4.83	4.30	9.20	11.6
53	66	FORD	200	6.98	85.77	390.27	3.28	0.93	4.21	3.73	0.10	16.2
54	68	CHEV	327	10.67	135.53	559.66	3.74	1.10	4.84	4.26	2.50	11.0
55	66	MERC	289	4.93	20.10	499.45	4.12	1.46	5.58	5.25	0.45	16.2
55R	66	MERC	289	4.68	17.82	488.84	4.16	1.43	5.59	4.51	0.45	16.6
56	71	FORD	351	4.26	52.16	402.24	3.53	0.89	4.42	3.76	5.20	12.7

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TABLE 13A

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

ST LOUIS

1972 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
57	72	BUIC	455	2.49	27.29	909.09	4.81	2.02	6.83	6.09	1.53	9.2
58	68	FORD	302	6.43	43.65	627.07	4.95	1.79	6.74	5.95	0.60	12.4
59	68	MERC	302	4.22	16.92	513.40	4.53	1.28	5.81	4.98	1.25	16.0
60	66	CHEV	194	7.44	118.34	343.92	3.33	0.79	4.12	3.72	9.20	15.5
61	69	CHEV	307	6.12	41.37	498.51	4.98	1.61	6.59	5.77	5.80	15.2
62	68	FORD	302	3.54	24.59	560.34	2.86	0.60	3.46	3.08	0.70	14.5
63	71	FORD	122	3.84	51.20	339.32	2.80	0.63	3.43	3.24	0.85	20.5
64	69	PONT	400	21.02	172.24	472.48	3.26	1.04	4.30	3.56	1.00	11.0
65	69	DODG	383	7.52	116.42	459.14	1.99	0.30	2.29	2.02	5.20	13.3
66	69	PLYM	318	4.05	35.65	540.41	5.23	1.68	6.91	6.09	3.20	14.6
67	69	OLDS	455	6.36	128.01	720.85	6.01	2.29	8.30	7.89	8.60	9.4
68	68	CHEV	230	16.08	126.52	480.31	4.78	1.83	6.61	5.83	10.00	12.2
69	69	CHEV	230	5.46	65.47	450.35	3.17	0.60	3.77	3.78	1.00	15.6
70	70	PLYM	318	3.95	40.73	680.25	6.91	4.35	11.26	9.45	5.10	11.7
72	69	FORD	302	6.16	82.18	545.28	3.01	0.72	3.73	3.59	8.00	12.8
73	70	FORD	250	4.84	38.89	434.53	3.14	0.70	3.84	3.39	4.80	17.4
74	68	CHRY	383	6.19	112.75	559.85	3.58	0.75	4.33	4.57	2.10	11.7
75	70	PLYM	318	13.84	124.79	508.43	4.11	1.20	5.31	4.80	1.40	11.9
76	72	CHEV	140	1.23	26.24	383.62	2.44	0.36	2.80	2.51	0.80	20.7
78	69	PLYM	318	6.25	85.46	513.93	3.03	0.54	3.57	3.50	0.50	13.3
79	67	CHEV	327	10.84	145.23	386.02	1.54	0.23	1.77	1.70	5.40	13.7
79R	67	CHEV	327	7.58	114.99	393.31	1.77	0.19	1.96	1.91	5.40	14.8
80	71	OLDS	455	2.72	18.53	721.43	5.08	2.26	7.34	7.00	0.80	11.7
81	68	DODG	318	4.93	40.19	481.29	4.30	1.37	5.67	5.44	6.00	15.8
82	70	CHEV	350	4.26	116.83	702.22	2.49	0.38	2.87	2.78	9.60	9.9
83	70	VOLK	97	2.18	20.34	333.43	2.52	0.34	2.86	2.79	1.00	23.8
84	69	VOLK	91	4.01	36.22	295.77	1.64	0.22	1.86	1.78	1.75	24.3
85	68	CHEV	307	9.83	139.90	458.33	2.04	0.18	2.22	2.17	5.60	12.5
85R	68	CHEV	307	10.12	138.24	476.76	2.12	0.32	2.44	2.39	5.60	12.2
86	66	RAMB	232	6.14	93.82	368.12	2.86	0.59	3.45	3.24	8.00	16.6
87	69	MERC	428	7.51	143.20	562.79	1.84	0.20	2.04	1.94	4.20	10.9
88	68	CHEV	327	6.25	53.32	418.23	3.20	0.63	3.83	3.81	4.60	17.0
89	68	CHEV	307	7.24	87.50	516.62	2.57	0.48	3.05	2.88	3.60	13.1
90	72	CHEV	400	3.28	64.88	907.26	3.16	0.62	3.78	3.88	2.20	8.7
91	68	FORD	300	4.62	36.14	601.46	3.04	0.56	3.60	3.64	1.20	13.2
92	69	FORD	302	3.93	45.84	576.66	4.90	1.26	6.16	6.28	1.25	13.4
93	69	OLDS	350	5.04	77.84	612.32	2.88	0.52	3.40	3.47	2.20	11.8
94	70	AMER	232	2.31	20.16	316.53	2.94	0.64	3.58	3.69	2.20	25.0
95	69	BUIC	350	2.98	47.59	580.65	4.93	1.67	6.60	6.21	2.20	13.3
95R	69	BUIC	350	3.63	60.32	551.41	4.45	1.32	5.77	5.34	2.10	13.4
96	70	VOLK	97	2.67	37.38	299.01	3.49	0.84	4.33	4.01	1.00	24.2
97	71	FORD	200	2.43	26.68	404.33	3.25	0.86	4.11	3.83	0.15	19.8
98	67	RAMB	232	8.79	113.60	415.08	1.95	0.28	2.23	2.03	1.80	14.3
99	69	CHEV	307	7.32	114.08	523.70	4.28	1.11	5.39	4.96	6.00	12.2
100	70	CHEV	350	5.06	49.88	579.96	4.03	1.15	5.18	4.77	4.60	13.2
101	69	CHEV	327	22.03	233.42	340.73	1.06	0.19	1.25	1.20	12.00	11.4
102	69	PONT	350	5.23	48.34	615.65	5.12	1.67	6.79	5.93	1.95	12.5
103	72	AMER	232	2.19	13.49	484.99	5.39	2.37	7.76	7.88	0.25	17.3
104	66	OLDS	330	8.88	116.54	611.65	2.73	0.63	3.36	3.26	4.60	10.8
105	70	PONT	400	9.32	18.60	830.20	3.71	0.85	4.56	4.45	0.25	10.0

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TABLE 13A

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

ST LOUIS

1972 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
107	72	FORD	122	3.47	36.34	395.03	3.36	0.82	4.16	3.82	1.60	19.2
108	70	OLDS	350	4.24	41.12	634.49	3.81	0.79	4.60	4.39	2.60	12.5
109	70	BUIC	350	13.17	180.49	484.06	2.53	0.42	2.95	2.60	6.20	11.0
110	71	TOYO	71	2.98	25.48	281.37	2.62	0.47	3.09	2.92	1.90	26.8
110R	71	TOYO	71	2.85	26.19	279.52	2.61	0.60	3.21	2.97	1.90	26.9
111	69	FORD	240	5.78	112.47	388.50	1.51	0.19	1.70	1.59	2.00	15.2
112	68	FORD	200	5.67	98.76	386.73	3.48	1.15	4.63	4.37	10.00	15.9
113	72	OLDS	350	5.50	88.87	658.50	4.17	1.31	5.48	5.95	6.00	10.9
114	72	FORD	302	4.80	101.72	598.46	1.72	0.25	1.97	1.79	1.15	11.5
115	70	CHEV	230	2.50	28.04	450.12	2.03	0.35	2.38	2.22	5.90	17.7
116	70	CHRY	440	20.86	72.22	365.08	2.39	0.79	3.18	2.99	4.00	16.3
117	70	CHEV	350	5.00	78.65	553.95	3.19	0.87	4.06	4.10	6.80	12.8
118	72	CHEV	350	5.27	32.52	730.56	3.45	0.73	4.18	3.98	0.65	11.1
119	70	OLDS	455	2.87	46.23	691.28	3.41	0.88	4.29	4.56	0.60	11.5
120	70	FORD	200	2.96	12.02	357.74	3.53	0.69	4.22	4.35	0.50	23.0
121	70	FORD	351	4.96	104.20	690.82	3.25	0.61	3.86	3.99	0.30	10.2
122	71	PLYM	360	4.76	87.82	584.45	4.10	1.02	5.12	5.24	5.00	12.0
124	71	FORD	302	3.94	36.24	652.34	2.83	0.50	3.33	3.35	0.20	12.3
125	72	VOLK	97	2.37	13.81	384.40	5.25	1.89	7.14	7.19	0.10	21.5
126	72	FORD	429	4.10	51.34	684.44	4.96	1.23	6.19	6.05	1.98	11.4
127	72	PONT	400	4.88	88.61	648.31	3.00	0.53	3.53	4.16	8.80	11.1
128	71	BUIC	350	3.21	71.15	819.89	3.74	0.89	4.63	4.35	1.25	9.4
129	71	CHEV	307	4.26	59.70	675.12	3.81	0.81	4.62	5.45	4.55	11.3
130	68	CADI	472	3.10	58.81	904.40	3.28	0.68	3.96	3.78	0.50	8.8
131	71	DODG	225	3.42	63.37	417.75	5.01	1.59	6.60	6.17	8.00	16.8
131R	71	DODG	225	3.39	59.52	405.77	4.73	1.36	6.09	5.74	8.00	17.4
132	72	FORD	351	3.84	27.07	710.24	5.39	2.00	7.39	7.11	1.50	11.6
133	71	CHEV	307	3.92	31.61	605.00	4.16	1.31	5.47	5.38	7.20	13.3
134	71	DODG	383	15.15	234.08	558.59	1.57	0.25	1.82	1.82	7.70	9.1
135	71	PLYM	318	3.10	26.01	595.38	3.52	0.75	4.27	3.82	2.20	13.7
137	72	PLYM	225	3.26	41.47	431.43	3.79	1.07	4.86	4.64	3.50	17.5
138	72	PLYM	340	5.37	81.13	502.68	3.49	1.03	4.52	4.20	3.10	13.7
140	72	DODG	318	3.61	31.94	488.40	4.08	0.64	4.72	4.47	3.60	16.1
141	67	CHEV	230	16.17	142.74	374.65	1.62	0.38	2.00	2.07	9.10	13.6
142	69	FORD	302	3.93	22.63	527.07	8.67	0.24	8.91	9.66	1.75	15.4
144	71	FORD	400	4.31	93.55	648.43	4.46	2.11	6.57	6.32	10.00	11.0
145	70	FORD	351	5.01	71.49	627.31	3.33	1.06	4.39	3.89	4.80	11.7
145R	70	FORD	351	6.36	93.25	601.51	3.75	1.01	4.76	4.32	4.80	11.5
146	71	OPEL	66	3.07	45.28	323.91	3.98	0.87	4.85	4.19	7.35	21.9
147	71	FORD	351	6.79	88.26	620.14	5.58	2.23	7.81	7.09	0.60	11.4
148	72	FORD	400	4.51	40.35	734.15	4.86	1.14	6.00	5.46	2.20	10.9
148R	72	FORD	400	5.11	72.99	750.36	4.74	1.20	5.94	5.58	2.20	10.0
149	71	VOLK	97	4.93	56.34	302.95	1.94	0.30	2.24	2.19	3.20	21.8
151	72	CHEV	350	4.72	51.89	658.28	2.25	0.31	2.56	2.37	6.75	11.8
152	71	CHEV	400	3.65	40.34	683.60	4.19	1.12	5.31	5.03	0.20	11.7
153	71	CHEV	307	6.28	30.45	525.97	5.26	1.51	6.77	6.24	8.30	14.9
154	70	DODG	383	35.47	66.78	568.82	5.59	3.13	8.72	8.82	8.00	11.3
155	71	VOLK	97	4.84	61.29	324.19	2.26	0.33	2.59	2.64	2.20	20.4
157	72	CHEV	307	3.65	15.30	603.53	3.58	1.11	4.69	4.27	1.75	13.9
158	66	BUIC	340	7.74	194.76	450.26	1.50	0.35	1.85	1.63	5.50	11.4

TABLE 13A

EXHAUST EMISSION TEST RESULTS IN G./MILE PER MILE

ST LOUIS

1972 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
159	72	PONT	350	4.41	90.11	724.13	3.79	0.88	4.67	4.38	9.00	10.1
160	68	FORD	390	4.81	63.52	604.15	5.77	2.86	8.63	7.92	3.10	12.3
162	72	OLDS	350	3.69	44.05	706.48	4.25	1.35	5.60	5.67	2.50	11.3
164	71	BUIC	350	5.48	105.10	694.19	3.57	1.01	4.58	4.49	0.20	10.1
165	72	CHEV	350	2.72	13.04	636.49	3.03	0.63	3.66	3.47	0.20	13.3
165R	72	CHEV	350	2.35	13.58	620.85	2.87	0.88	3.75	3.43	0.20	13.6
166	70	FORD	250	4.20	59.96	412.25	5.56	2.13	7.69	6.92	5.80	17.1
166R	70	FORD	250	4.09	57.98	422.92	5.15	2.30	7.45	6.55	5.80	16.8
167	70	CHEV	350	4.28	73.65	682.85	2.80	0.68	3.48	3.16	2.75	10.9
168	71	MERC	400	8.91	138.60	537.53	3.51	0.87	4.38	3.93	10.00	11.3
169	70	TOYO	113	9.35	88.46	336.60	2.65	0.42	3.07	2.87	4.25	17.6
170	71	CHEV	140	2.05	44.87	372.80	3.94	1.04	4.98	4.70	0.20	19.7
171	71	CHEV	307	8.40	38.63	549.30	2.53	0.67	3.20	3.34	2.80	13.9
172	72	FORD	351	2.50	33.06	785.80	4.46	1.50	5.96	6.80	0.20	10.5
173	71	DATS	97	7.44	107.06	244.30	1.77	0.25	2.02	1.76	6.40	19.5
174	67	FORD	289	5.38	101.72	450.34	2.23	0.33	2.56	3.08	9.90	14.1
175	66	PONT	326	8.61	40.25	515.35	3.35	0.67	4.02	3.55	3.60	14.6
176	70	FORD	302	3.71	31.71	664.36	3.30	0.83	4.13	4.03	0.25	12.2
177	70	PONT	350	7.13	51.59	658.26	3.86	1.24	5.10	5.02	2.50	11.6
178	70	BUIC	455	5.61	101.18	733.51	5.13	1.38	6.51	6.45	6.30	9.7
179	72	FORD	351	3.26	57.09	669.96	4.33	1.07	5.40	5.42	0.85	11.5
180	68	PONT	350	4.21	59.41	660.51	3.83	0.85	4.68	4.85	1.25	11.6
181	67	PONT	326	6.18	69.91	550.74	4.16	1.42	5.58	5.55	3.40	13.0
182	67	MERC	390	7.50	53.58	689.98	2.81	0.63	3.44	3.40	3.00	11.1
183	66	PLYM	225	7.56	134.09	434.43	1.09	0.09	1.18	1.28	2.35	13.3
184	72	CHEV	454	2.89	40.72	780.06	4.51	1.38	5.89	5.73	1.20	10.4
185	71	OLDS	350	4.05	61.44	575.50	4.07	0.90	4.97	4.70	1.85	13.0
186	71	PONT	350	4.32	86.72	717.93	3.21	0.79	4.00	3.94	4.50	10.2
187	67	BUIC	340	7.55	129.93	483.95	1.51	0.26	1.77	1.64	3.90	12.5
188	71	CHEV	402	2.64	10.11	774.82	4.31	1.57	5.88	5.84	0.20	11.1

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TABLE 13B

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

LOS ANGELES

1975 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
1	70	FORD	250	4.07	59.87	405.08	4.64	1.91	6.55	6.08	7.00	17.3
2	70	VOLK	97	3.23	34.11	325.41	3.28	0.64	3.92	3.74	2.75	22.8
3	70	CHEV	307	3.37	35.57	588.47	4.32	1.34	5.66	5.30	1.00	13.5
4	68	CHEV	327	8.48	85.32	499.62	3.64	1.01	4.65	4.48	0.80	13.4
5	70	BUIC	455	5.39	94.99	635.88	3.88	1.30	5.18	4.77	2.50	11.1
6	66	RAMB	232	2.94	79.41	397.38	2.27	0.41	2.68	2.53	3.00	16.7
7	72	FORD	302	2.25	32.50	726.68	2.98	0.59	3.57	3.51	1.75	11.3
8	72	OLDS	350	3.83	54.90	718.00	3.02	0.82	3.84	3.80	1.50	10.9
9	72	FORD	400	2.27	34.73	839.01	3.88	1.28	5.16	5.04	0.10	9.9
10	70	CHEV	307	5.36	87.12	524.55	3.19	0.65	3.84	3.63	5.00	13.1
11	66	CHEV	327	5.61	89.97	541.28	3.46	1.17	4.63	4.62	5.50	12.7
12	72	DATS	72	2.52	25.01	275.36	2.49	0.43	2.92	2.94	3.20	27.5
13	66	CHEV	327	2.43	155.65	454.62	1.88	0.37	2.25	2.19	6.20	12.2
15	67	BUIC	340	2.38	56.17	552.95	1.37	0.20	1.57	1.48	1.50	13.7
16	72	FORD	122	3.33	27.49	353.18	3.17	0.85	4.02	3.83	2.50	21.8
18	68	DODG	393	5.59	88.64	585.94	2.62	0.83	3.45	3.10	0.80	11.9
19	71	FORD	429	4.91	80.01	638.20	4.22	1.39	5.61	4.95	6.50	11.4
20	69	BUIC	350	3.32	59.72	555.05	4.40	1.26	5.66	5.49	1.50	13.5
21	70	CHEV	350	2.53	26.69	649.87	3.40	0.89	4.29	4.15	0.50	12.7
22	66	CHEV	283	3.36	21.32	512.66	4.02	1.68	5.70	5.81	2.40	15.9
23	71	MERC	302	3.40	68.73	665.12	2.32	0.36	2.68	2.73	5.50	11.3
24	72	PLYM	318	3.99	96.43	538.41	2.09	0.33	2.42	2.39	8.00	12.6
25	68	PONT	400	2.45	32.10	761.60	3.23	0.88	4.11	3.91	0.80	10.8
26	72	DODG	360	7.54	110.76	610.39	2.58	0.66	3.24	3.10	6.50	11.0
27	68	CHEV	327	7.94	58.83	526.97	4.78	2.34	7.12	7.28	6.50	13.8
28	72	FORD	302	4.10	73.63	630.62	3.09	1.12	4.21	4.15	5.80	11.7
29	69	FORD	302	6.77	75.24	532.86	6.47	2.86	9.33	9.93	6.50	13.2
30	71	CHEV	140	2.63	41.80	377.93	3.10	0.63	3.73	3.55	0.80	19.6
30R	71	CHEV	140	2.44	43.19	367.78	2.88	0.62	3.50	3.69	0.80	20.0
31	68	FORD	200	3.02	30.54	528.07	5.19	2.37	7.56	7.53	2.20	15.2
32	71	FORD	351	2.64	68.76	319.29	2.52	0.74	3.26	3.27	9.00	20.4
33	69	FORD	390	3.51	18.59	640.03	5.16	2.32	7.48	7.29	0.02	13.0
34	69	CADI	472	1.04	30.75	1124.66	3.59	0.94	4.53	4.64	0.25	7.5
35	70	MERC	351	8.48	116.60	590.01	4.67	1.66	6.33	6.48	10.00	11.1
36	66	FORD	289	3.52	38.44	533.31	2.01	0.46	2.47	2.38	1.60	14.7
37	68	VOLK	91	5.10	103.16	259.65	1.43	0.15	1.58	1.45	6.80	20.3
38	71	DATS	146	4.27	40.11	409.47	2.77	0.65	3.42	3.34	2.50	18.3
39	71	PONT	400	4.10	66.37	733.06	3.47	0.85	4.32	4.25	0.20	10.4
40	67	PONT	326	2.85	48.44	682.92	2.60	0.50	3.10	3.01	4.00	11.6
41	70	FORD	250	2.94	51.38	424.72	2.41	0.33	2.74	2.62	2.10	17.2
42	67	CHEV	250	1.21	18.23	709.67	3.14	0.64	3.78	3.63	1.90	12.0
42R	67	CHEV	250	0.99	18.61	503.98	2.58	0.50	3.08	2.90	1.90	16.5
43	66	PONT	389	3.85	78.74	498.89	2.86	0.62	3.48	3.15	2.25	14.0
44	71	PLYM	318	3.48	75.12	445.04	2.38	0.61	2.99	2.76	6.00	15.5
45	70	FORD	351	3.69	81.35	695.53	2.07	0.30	2.37	2.25	0.50	10.6
45R	70	FORD	351	3.49	81.95	676.80	1.88	0.33	2.21	2.19	0.50	10.8
46	71	FORD	250	2.65	44.41	522.74	2.42	0.49	2.91	2.64	3.50	14.8
47	69	MERC	390	6.31	113.12	649.04	3.67	1.16	4.83	4.94	6.80	10.5
48	69	CHEV	350	4.71	46.51	487.16	3.51	0.96	4.47	4.15	7.50	15.4
49	69	FORD	390	5.12	111.95	538.22	3.76	1.23	4.99	4.84	7.30	12.2

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TABLE 13B

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

LOS ANGELES

1975 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
50	67	FORD	289	3.22	43.54	395.29	2.59	0.64	3.25	3.17	0.60	18.7
51	68	BUIC	350	22.27	24.27	602.55	4.05	1.52	5.57	5.82	0.10	12.5
52	67	MERC	410	7.75	129.53	624.53	2.56	0.60	3.16	3.02	4.00	10.4
53	68	PONT	350	6.13	84.18	564.96	4.29	2.22	6.51	6.21	6.80	12.4
54	71	CHEV	350	3.67	70.43	674.29	3.41	0.99	4.40	4.27	1.25	11.1
56	71	DODG	318	3.81	92.66	517.69	2.37	0.62	2.99	3.09	7.80	13.1
57	66	FORD	200	4.17	123.69	402.10	1.12	0.13	1.25	1.17	10.00	14.6
58	70	FORD	302	4.86	76.05	519.12	3.69	1.39	5.08	4.65	7.00	13.6
59	66	VOLK	78	53.37	183.21	181.28	0.48	0.04	0.52	0.52	4.00	18.9
60	69	PONT	400	4.07	61.39	643.06	3.64	1.04	4.68	4.47	4.20	11.8
61	70	FORD	351	3.29	33.00	667.57	5.02	2.21	7.23	6.90	0.15	12.2
62	71	CHEV	350	2.81	31.34	661.31	3.27	0.88	4.15	4.14	0.10	12.3
62R	71	CHEV	350	2.83	27.28	682.95	3.32	0.86	4.18	4.08	0.10	12.0
63	70	CHEV	402	17.71	163.04	589.64	1.08	0.13	1.21	1.20	5.00	9.8
64	70	PONT	350	4.49	71.17	608.51	3.59	1.07	4.66	4.34	1.80	12.1
65	66	PLYM	225	6.51	125.99	386.01	2.69	0.82	3.51	3.37	10.00	14.7
67	70	CHEV	307	5.53	52.65	454.87	4.82	2.00	6.82	6.15	6.00	16.0
68	70	OLDS	350	3.84	56.30	630.41	3.37	0.75	4.12	4.00	5.50	12.1
69	68	FORD	302	4.77	54.99	506.29	4.87	2.46	7.33	6.60	2.00	14.6
70	69	PONT	400	4.65	82.72	588.65	4.04	0.90	4.94	4.90	5.50	12.1
71	69	OLDS	350	3.26	47.34	666.82	3.31	0.65	3.96	3.89	4.30	11.8
72	69	CHEV	230	5.16	62.01	369.95	3.25	0.83	4.08	3.83	0.40	18.3
73	71	TOYO	113	2.09	35.26	344.96	3.46	1.09	4.55	4.60	1.60	21.8
74	66	PONT	389	3.84	44.89	584.08	5.17	2.18	7.35	7.17	4.80	13.3
75	71	FORD	351	3.21	31.32	600.47	3.35	0.84	4.19	3.89	1.10	13.4
76	71	VOLK	97	6.24	55.37	395.47	3.03	0.68	3.71	3.75	2.00	17.7
77	68	PLYM	318	4.47	27.37	505.74	5.02	2.03	7.05	6.71	0.05	15.8
78	71	BUIC	455	2.84	53.64	779.53	4.15	1.37	5.52	5.05	3.00	10.2
79	69	OLDS	455	2.89	49.26	600.88	4.11	1.16	5.27	4.85	2.50	12.9
80	72	FORD	429	3.48	91.05	685.90	2.54	0.45	2.99	2.79	5.00	10.6
81	70	AMER	304	5.10	67.03	569.01	2.79	0.41	3.20	3.05	2.00	12.9
82	72	BUIC	350	1.44	24.87	610.24	3.55	1.19	4.74	4.24	2.50	13.6
83	68	FORD	390	4.66	67.69	512.43	3.75	0.85	4.60	3.91	5.20	14.0
84	70	DODG	225	2.85	54.27	358.90	5.02	2.04	7.06	6.42	2.50	19.6
86	66	BUIC	340	4.02	95.19	463.09	0.78	0.08	0.86	0.75	1.00	14.2
87	71	CHEV	350	4.23	52.46	588.48	4.73	1.79	6.52	5.68	3.40	13.0
88	68	OLDS	455	4.73	59.26	535.36	4.85	2.06	6.91	6.59	5.20	13.8
89	70	BUIC	455	5.28	89.43	557.79	4.52	1.84	6.36	5.95	5.20	12.4
90	71	VOLK	97	4.27	49.59	277.33	2.42	0.71	3.13	2.88	3.20	24.1
91	70	PLYM	383	5.09	78.56	556.15	4.05	1.05	5.10	5.08	6.80	12.8
92	67	OLDS	425	3.98	55.26	583.04	3.77	1.00	4.77	4.64	6.40	13.0
93	68	FORD	390	4.50	15.44	512.51	3.61	0.83	4.44	4.33	0.40	16.1
94	71	PLYM	225	4.76	100.61	331.00	1.61	0.28	1.89	1.92	0.80	17.6
95	67	VOLK	91	20.60	113.56	192.67	1.42	0.08	1.50	1.43	2.40	20.3
96	68	MERC	302	21.71	50.12	523.92	2.36	0.62	2.98	2.53	0.80	13.2
97	69	BUIC	430	2.25	48.84	744.04	3.75	0.84	4.59	4.27	2.60	10.7
98	69	VOLK	97	5.08	82.85	310.98	2.01	0.25	2.26	2.17	4.80	19.4
99	71	FORD	98	8.11	26.20	305.25	2.53	0.63	3.16	2.80	0.20	23.8
100	70	CHRY	440	8.81	120.13	600.64	4.07	1.25	5.32	4.97	4.80	10.4
101	69	CHEV	327	28.49	161.78	385.19	2.71	1.19	3.90	3.67	10.00	12.2

TABLE 13B

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

LOS ANGELES

1975 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
102	68	CHRY	383	7.53	123.60	529.43	4.12	1.55	5.67	5.30	8.20	11.9
103	69	FORD	302	3.78	76.69	430.09	3.08	0.67	3.75	3.53	2.80	15.8
104	68	CHEV	307	7.73	105.48	450.42	3.50	0.80	4.30	4.11	5.20	13.9
105	71	LINC	460	3.57	60.76	762.12	4.29	1.56	5.85	5.87	1.75	10.2
106	68	FORD	289	11.84	39.19	459.86	4.36	1.69	6.05	5.64	6.00	15.9
107	67	PLYM	318	7.62	167.86	434.45	1.01	0.08	1.09	1.01	4.00	12.3
108	72	CHEV	400	1.66	21.05	824.65	2.90	0.56	3.46	3.31	0.10	10.3
109	72	FORD	351	4.01	76.80	663.65	3.39	0.72	4.11	3.86	3.60	11.1
110	70	FORD	302	8.10	134.04	511.41	1.94	0.19	2.13	1.99	5.00	11.9
111	70	PLYM	318	4.14	59.62	545.64	5.55	2.08	7.63	6.89	2.90	13.6
112	72	CHRY	400	3.56	75.28	674.75	4.24	1.28	5.52	5.50	5.50	11.0
113	67	CHEV	250	2.21	63.17	567.76	2.67	0.70	3.37	3.16	3.40	13.2
114	66	DODG	383	3.72	55.78	591.82	4.40	1.13	5.53	5.31	1.00	12.8
115	66	MERC	390	2.65	49.80	728.20	2.68	0.50	3.18	2.80	1.70	10.9
117	67	CHRY	383	9.37	145.21	585.76	2.42	0.49	2.91	2.77	4.00	10.5
118	68	CADI	472	2.93	53.83	738.45	5.22	2.07	7.29	7.56	0.10	10.7
119	66	OLDS	330	8.29	111.18	451.90	2.49	0.37	2.86	2.67	9.50	13.6
120	70	VOLK	97	2.91	30.18	301.03	2.60	0.43	3.03	2.88	2.20	24.8
122	72	CHEV	350	1.46	29.48	658.17	2.54	0.48	3.02	2.81	0.75	12.5
123	68	CHEV	307	4.59	59.77	515.57	3.05	0.53	3.58	3.09	2.80	14.2
124	72	CHEV	350	26.79	45.45	598.67	2.16	0.34	2.50	2.33	10.00	11.8
125	67	FORD	390	4.82	51.20	540.07	4.64	1.41	6.05	5.58	4.25	14.0
126	66	CADI	429	2.74	48.01	670.42	5.21	2.11	7.32	6.20	2.80	11.8
127	67	PONT	400	3.98	64.26	610.43	5.54	2.29	7.83	7.32	6.50	12.3
128	70	TOYO	116	3.40	85.66	361.97	2.55	0.71	3.26	2.97	0.40	17.5
129	67	CHEV	327	2.92	36.08	689.35	4.12	1.05	5.17	4.82	0.20	11.8
130	72	CHEV	350	0.99	13.46	744.38	1.97	0.34	2.31	2.16	0.10	11.5
131	67	FORD	289	4.37	107.52	504.48	1.83	0.24	2.07	1.82	2.40	12.9
132	69	PLYM	318	4.87	90.04	539.41	4.61	1.07	5.68	4.89	5.00	12.7
133	72	CHEV	140	2.02	48.16	401.90	2.10	0.29	2.39	2.44	2.50	18.2
134	67	CHEV	327	7.98	133.40	548.36	3.61	0.83	4.44	4.15	7.50	11.3
135	67	AMER	232	2.81	21.65	441.45	4.90	1.74	6.64	6.26	0.90	18.3
136	71	DODG	383	2.67	90.83	594.29	3.29	0.67	3.96	3.71	2.70	11.9
137	69	CHEV	307	5.23	115.57	441.70	2.54	0.36	2.90	2.71	6.00	13.9
138	68	CHEV	250	1.96	45.28	520.04	2.02	0.45	2.47	2.31	7.00	14.9
139	71	OPEL	116	6.03	59.77	371.06	4.62	1.22	5.84	5.52	10.00	18.3
140	72	OLDS	455	1.88	24.32	900.78	4.13	1.81	5.94	5.83	0.30	9.4
141	71	OLDS	455	2.41	56.08	813.96	3.95	0.99	4.94	4.68	2.60	9.8
142	71	BUIC	455	5.42	148.60	720.95	1.83	0.20	2.03	1.94	3.40	9.1
143	72	TOYO	120	3.21	37.60	344.33	3.48	0.83	4.31	4.20	4.10	21.5
144	69	PLYM	318	3.99	78.35	549.81	3.55	0.73	4.28	3.92	3.70	12.9
145	71	CHEV	350	9.61	61.01	610.72	2.63	0.28	2.91	2.84	0.80	12.0
146	72	CHEV	350	3.73	56.19	668.83	2.26	0.58	2.84	2.77	6.00	11.5
147	71	CHEV	350	3.27	30.16	594.96	2.87	0.56	3.43	3.31	0.80	13.6
148	67	CHEV	283	5.26	62.06	540.60	3.58	0.67	4.25	4.18	3.30	13.6
149	69	CHEV	327	7.05	76.09	591.53	4.11	1.23	5.34	5.10	3.60	12.1
149R	69	CHEV	327	3.70	63.65	658.30	3.17	0.48	3.65	3.59	3.60	11.5
150	68	RAMB	290	3.91	51.87	520.71	3.87	0.87	4.74	4.59	0.90	14.4
150R	68	RAMB	290	3.48	53.63	517.52	3.78	0.68	4.46	4.29	0.90	14.5
151	70	PONT	350	33.29	84.92	622.11	4.36	1.41	5.77	5.71	2.80	10.3

TABLE 13B

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

LOS ANGELES

1975 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
151R	70	PONT	350	34.83	81.75	719.38	4.15	1.08	5.23	5.10	2.80	9.2
152	71	OLDS	350	1.72	34.53	778.77	3.84	1.03	4.87	4.68	0.20	10.6
153	72	MERC	400	2.72	43.41	856.53	6.08	2.33	8.41	8.08	0.10	9.5
154	71	CHEV	400	2.79	30.87	746.45	3.82	0.80	4.62	4.48	0.15	11.0
155	71	PONT	350	4.24	86.44	657.68	3.10	0.49	3.59	3.48	3.00	11.0
156	72	AMER	258	1.65	22.95	515.84	3.86	0.96	4.82	4.70	0.70	15.9
157	66	CHEV	283	5.02	87.23	603.07	2.99	0.63	3.62	3.45	10.00	11.7
157R	66	CHEV	283	4.30	71.55	570.04	3.30	0.87	4.17	4.06	10.00	12.7
158	72	CHEV	350	2.13	42.62	700.53	2.39	0.47	2.86	2.76	4.20	11.5
159	71	FORD	351	3.44	46.34	562.24	3.62	0.99	4.61	4.50	2.70	13.7
160	72	DODG	225	2.09	61.86	538.28	2.67	0.47	3.14	3.08	5.20	13.8
161	67	DODG	225	3.05	39.56	447.53	4.87	1.71	6.58	6.36	1.20	17.1
162	72	PONT	350	2.97	38.25	695.53	3.19	0.67	3.86	3.78	0.60	11.6
163	72	CADI	472	0.87	22.95	997.07	3.71	1.02	4.73	4.64	1.25	8.6
164	72	VOLK	97	2.62	39.68	354.36	2.18	0.19	2.37	2.32	0.65	20.9
165	72	PLYM	360	2.91	45.83	798.17	3.27	0.84	4.11	4.00	0.20	10.1
167	72	VOLK	102	2.59	37.38	422.02	2.73	0.63	3.36	3.23	0.40	18.1
168	72	BUIC	455	3.19	64.92	891.31	2.94	0.74	3.68	3.43	2.50	8.8
169	72	BUIC	455	2.47	15.70	847.55	3.87	1.09	4.96	4.65	0.20	10.1
169R	72	BUIC	455	2.29	13.26	832.40	3.75	1.12	4.87	4.76	0.20	10.3
170	72	PLYM	340	5.31	79.18	532.22	3.87	1.16	5.03	4.80	5.50	13.2
170R	72	PLYM	340	4.05	78.31	531.44	3.27	0.95	4.22	4.12	5.50	13.3
172	72	PONT	400	3.50	35.28	785.34	3.69	1.75	5.44	5.20	0.65	10.4
173	69	DODG	440	4.96	50.86	660.52	2.30	0.35	2.65	2.53	0.25	11.7
174	70	OLDS	350	5.52	99.01	588.71	3.78	1.21	4.99	4.84	6.00	11.7
175	69	FORD	250	2.73	35.72	462.38	5.19	1.89	7.08	6.92	1.60	16.8
176	70	DODG	440	15.93	175.91	557.12	2.55	0.62	3.17	3.14	8.90	10.0
177	66	FORD	390	3.68	88.77	802.66	3.29	0.72	4.01	4.08	5.00	9.3
178	72	CHEV	402	1.95	35.13	814.09	2.69	0.64	3.33	3.70	0.50	10.1
179	72	FORD	302	3.42	47.75	739.13	3.11	0.56	3.67	3.78	0.20	10.8

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TABLE 13B

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

ST LOUIS

1975 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
1	67	VOLK	91	5.78	48.95	286.30	1.53	0.12	1.65	1.53	1.20	23.3
2	72	CHEV	350	3.03	26.43	659.05	2.95	0.53	3.48	3.14	0.10	12.5
3	66	CADI	429	10.58	223.81	531.17	0.92	0.08	1.00	0.94	1.00	9.7
4	72	BUIC	455	2.22	12.08	758.71	5.41	1.75	7.16	7.67	1.20	11.3
5	71	PONT	455	4.09	13.10	658.75	5.69	1.74	7.43	6.33	0.10	12.8
6	72	DODG	225	2.27	22.13	439.86	4.28	1.07	5.35	4.92	0.50	18.4
7	72	CHRY	400	3.26	40.36	615.75	4.86	1.02	5.88	5.35	0.50	12.9
8	72	PLYM	318	2.52	8.81	549.39	4.04	0.81	4.85	4.71	0.10	15.5
9	67	CHEV	283	11.91	161.35	373.53	1.58	0.21	1.79	1.69	7.50	13.3
10	66	FORD	289	4.76	48.98	439.00	5.51	1.71	7.22	6.34	1.85	16.7
11	67	CHEV	327	6.16	50.51	430.71	2.93	0.51	3.44	3.14	7.30	16.8
12	67	DODG	225	4.36	82.18	315.07	2.95	0.25	2.60	2.33	7.10	19.4
14	69	BUIC	430	4.97	72.06	510.20	4.32	1.79	6.11	5.55	2.20	13.9
16	66	VOLK	78	5.10	66.72	220.65	0.94	0.07	1.01	0.94	5.20	26.0
17	70	DODG	318	7.49	28.43	615.06	4.90	1.08	5.98	5.13	0.50	13.0
18	69	CHEV	396	5.96	115.07	541.69	2.38	0.20	2.58	2.21	4.90	12.0
19	72	MERC	351	2.76	17.04	740.71	4.78	1.16	5.94	5.37	0.10	11.4
20	66	CHEV	283	6.49	55.44	499.27	2.73	0.44	3.17	2.73	2.10	14.6
21	70	MERC	351	4.04	23.16	588.95	3.20	0.69	3.89	3.52	1.65	13.9
22	69	FORD	429	3.03	24.64	364.68	2.81	0.43	3.24	2.70	4.00	21.5
23	68	RAMB	290	1.99	13.49	306.13	2.62	0.45	3.07	2.44	3.80	26.6
24	69	CADI	472	2.48	29.80	797.74	5.54	1.65	7.19	6.07	0.10	10.4
25	72	BUIC	350	3.83	33.49	689.27	4.76	1.42	6.18	5.24	0.50	11.8
26	68	VOLK	91	19.40	119.30	293.97	1.75	0.21	1.96	1.77	2.20	16.3
27	72	CADI	472	2.12	20.79	889.08	5.22	1.91	7.13	6.04	0.05	9.6
28	71	LINC	460	3.69	29.17	703.61	6.44	2.58	9.02	7.93	0.05	11.7
29	72	TOYO	120	2.15	21.66	380.75	3.60	1.09	4.69	4.12	3.20	21.1
30	66	CHEV	283	14.65	141.57	422.80	2.07	0.38	2.45	2.13	1.50	12.8
31	72	DATS	97	2.32	30.89	305.24	2.88	0.58	3.46	2.86	0.0	24.6
32	67	FORD	390	5.37	49.86	566.28	5.90	1.96	7.86	6.83	2.80	13.4
34	66	PONT	389	8.45	125.71	408.61	0.27	0.03	0.30	0.25	1.00	14.0
36	67	CHRY	383	8.20	184.65	437.04	1.55	0.18	1.73	1.50	4.60	11.8
37	72	VOLK	97	2.79	31.64	312.73	2.45	0.43	2.88	2.36	2.10	23.9
38	67	OLDS	330	6.76	105.57	679.99	3.09	0.76	3.85	3.59	4.00	10.2
39	68	BUIC	350	5.58	135.01	516.06	3.33	0.61	3.94	3.37	5.40	11.9
40	66	CHEV	283	7.18	61.45	463.64	4.24	1.09	5.33	4.74	1.50	15.2
41	66	FORD	390	6.89	100.28	436.05	2.75	0.53	3.28	2.99	3.80	14.4
44	67	PONT	400	9.74	135.90	549.65	2.50	0.37	2.87	2.59	3.80	11.2
45	68	PONT	400	5.50	87.78	561.51	5.00	1.82	6.82	5.92	8.20	12.4
46	66	DODG	383	7.63	43.82	562.43	4.11	1.29	5.40	4.69	5.80	13.5
47	67	PLYM	273	9.03	75.85	452.30	4.85	1.62	6.47	5.72	8.80	14.8
48	67	FORD	289	5.31	118.30	415.77	2.13	0.32	2.45	2.21	7.40	14.3
49	68	PLYM	318	3.13	24.91	517.42	4.69	1.90	6.59	5.77	0.25	15.7
50	68	OLDS	350	4.90	57.50	567.10	5.05	1.79	6.84	5.72	2.80	13.2
52	67	CHEV	327	7.95	119.24	478.76	4.31	1.56	5.87	5.22	5.20	12.8
53	66	FORD	200	5.50	42.73	384.40	4.23	1.42	5.65	5.01	0.10	18.9
54	68	CHEV	327	9.38	109.30	506.85	3.83	1.25	5.08	4.46	2.50	12.5
55	66	MERC	289	4.62	18.87	491.30	4.24	1.37	5.61	5.28	0.45	16.6
55R	66	MERC	289	4.41	15.89	479.43	4.25	1.35	5.60	4.52	0.45	17.1
56	71	FORD	351	3.37	35.19	595.68	3.64	0.92	4.56	3.87	5.20	13.4

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TABLE 13D

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

ST LOUIS

1975 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
57	72	BUIC	455	2.17	24.35	873.75	4.82	1.93	6.75	6.01	1.50	9.7
58	68	FORD	302	5.42	33.78	605.43	4.85	1.81	6.66	5.88	0.60	13.1
59	68	MERC	302	3.98	15.37	497.11	4.54	1.38	5.92	5.07	1.25	16.6
60	66	CHEV	194	7.18	112.96	352.14	3.24	0.75	3.99	3.61	9.20	16.1
61	69	CHEV	307	5.65	36.05	462.56	4.82	1.51	6.33	5.54	5.80	16.5
62	68	FORD	302	3.17	19.59	535.87	2.90	0.64	3.54	3.16	9.70	15.4
63	71	FORD	122	3.42	44.31	326.47	2.89	0.65	3.54	3.35	0.85	21.8
64	69	PONT	400	14.34	140.43	456.16	3.47	1.09	4.56	3.77	1.00	12.3
65	69	DODG	383	6.50	87.95	448.44	2.31	0.39	2.70	2.37	5.20	14.6
66	69	PLYM	318	3.73	31.49	522.04	5.20	1.93	7.13	6.29	3.20	15.2
67	69	OLDS	455	5.51	98.50	694.56	6.18	2.37	8.55	8.13	8.60	10.2
68	68	CHEV	230	12.86	85.12	468.89	4.96	2.06	7.02	6.19	10.00	13.8
69	69	CHEV	230	3.96	38.21	438.08	3.30	0.74	4.04	4.05	1.00	17.4
70	70	PLYM	318	3.29	32.71	657.22	6.97	4.27	11.24	9.43	5.10	12.3
72	69	FORD	302	5.01	76.14	521.80	2.87	0.74	3.61	3.48	8.00	13.5
73	70	FORD	250	4.84	36.25	409.40	2.96	0.66	3.62	3.19	4.80	18.4
74	68	CHRY	383	4.90	71.33	562.93	4.27	1.16	5.43	5.72	2.10	12.9
75	70	PLYM	318	10.35	67.21	517.97	4.77	1.55	6.32	5.71	1.40	13.5
76	72	CHEV	140	1.00	20.43	367.13	2.50	0.40	2.90	2.60	0.80	22.1
78	69	PLYM	318	4.76	41.68	514.52	3.64	1.08	4.72	4.63	0.50	14.9
79	67	CHEV	327	8.52	122.54	376.85	1.63	0.24	1.87	1.79	5.40	14.9
79R	67	CHEV	327	6.69	102.73	378.09	1.82	0.18	2.00	1.95	5.40	15.8
80	71	OLDS	455	2.19	12.83	693.26	5.06	2.01	7.07	6.74	9.80	12.3
81	68	DODG	318	4.48	35.22	472.10	4.33	1.44	5.77	5.54	6.00	16.4
82	70	CHEV	350	3.86	98.08	671.82	2.48	0.38	2.86	2.78	9.60	10.6
83	70	VOLK	97	1.88	16.59	335.69	2.44	0.30	2.74	2.68	1.00	24.1
84	69	VOLK	91	3.62	31.75	298.07	1.63	0.18	1.81	1.73	1.75	24.7
85	68	CHEV	307	8.74	106.46	452.24	2.46	0.33	2.79	2.73	5.60	13.7
85R	68	CHEV	307	8.93	102.90	469.30	2.53	0.43	2.96	2.90	5.60	13.4
86	66	RAMB	232	5.13	81.94	361.81	2.96	0.58	3.54	3.33	8.00	17.5
87	69	MERC	428	6.04	116.08	554.51	2.04	0.26	2.30	2.19	4.20	11.7
88	68	CHEV	327	5.86	43.17	399.65	3.20	0.62	3.82	3.80	4.60	18.3
89	68	CHEV	307	6.52	76.84	501.60	2.49	0.41	2.90	2.74	3.60	13.8
90	72	CHEV	400	2.52	41.70	861.57	3.43	0.74	4.17	4.29	0.20	9.5
91	68	FORD	390	4.40	28.69	584.26	3.10	0.52	3.62	3.67	1.20	13.8
92	69	FORD	302	3.43	30.41	561.96	5.00	1.40	6.40	6.53	1.25	14.3
93	69	OLDS	350	3.86	46.63	595.62	2.99	0.50	3.49	3.56	2.20	13.0
94	70	AMER	232	2.03	16.92	302.20	3.02	0.72	3.74	3.85	2.20	26.5
95	69	BUIC	350	2.66	35.74	570.10	5.12	1.73	6.85	6.44	2.20	14.0
95R	69	BUIC	350	2.89	36.73	547.19	4.69	1.48	6.17	5.72	2.10	14.4
96	70	VOLK	97	2.13	35.02	297.04	3.41	1.02	4.43	4.11	1.00	24.7
97	71	FORD	200	2.28	25.81	394.58	3.28	0.84	4.12	3.84	0.15	20.1
98	67	RAMB	232	8.30	111.07	409.32	1.84	0.25	2.09	1.90	1.80	14.5
99	69	CHEV	307	6.17	88.63	509.40	4.44	1.24	5.68	5.23	6.00	13.3
100	70	CHEV	350	4.68	42.17	568.55	4.81	0.64	5.45	5.02	4.60	13.7
101	69	CHEV	327	20.12	196.83	346.47	1.36	0.27	1.63	1.57	10.00	12.3
102	69	PONT	350	4.67	36.22	595.78	5.42	1.81	7.23	6.32	1.95	13.3
103	72	AMER	232	2.09	10.05	476.84	5.51	2.19	7.70	7.82	0.25	17.8
104	66	OLDS	330	8.10	94.71	601.05	2.79	0.65	3.44	3.34	4.60	11.4
105	70	PONT	400	8.73	12.39	795.95	3.81	0.93	4.74	4.62	0.25	10.5

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TABLE 13B

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

ST LOUIS

1975 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
107	72	FORD	122	3.14	28.38	387.23	3.49	0.84	4.33	3.96	1.63	20.1
108	70	OLDS	350	3.85	33.64	614.45	3.69	0.90	4.59	4.37	2.60	13.1
109	70	BUIC	350	7.90	114.32	486.29	3.13	0.64	3.77	3.31	6.20	12.8
110	71	TOYO	71	2.77	23.96	272.76	2.56	0.43	2.99	2.83	1.90	27.8
110R	71	TOYO	71	2.67	23.71	268.25	2.60	0.57	3.17	2.93	1.90	28.2
111	69	FORD	240	5.32	97.77	382.80	1.53	0.08	1.61	1.50	2.00	16.0
112	68	FORD	200	5.57	104.41	364.86	2.96	0.88	3.84	3.62	10.00	16.2
113	72	OLDS	350	4.56	83.05	640.01	4.22	1.22	5.44	5.90	6.00	11.3
114	72	FORD	302	3.61	54.28	602.32	2.16	0.39	2.55	2.31	1.15	12.7
115	70	CHEV	230	2.03	19.37	437.59	1.99	0.34	2.33	2.17	5.90	18.7
116	70	CHRY	440	18.53	47.27	354.53	2.76	0.95	3.71	3.50	4.00	18.2
117	70	CHEV	350	4.50	66.37	524.54	3.38	0.95	4.33	4.37	6.80	13.8
118	72	CHEV	350	4.82	28.29	730.05	3.37	0.85	4.22	4.02	0.05	11.2
119	70	OLDS	455	2.67	37.75	673.94	3.35	0.83	4.18	4.44	0.60	12.0
120	70	FORD	200	2.68	8.16	355.43	3.61	0.77	4.38	4.51	0.50	23.6
121	70	FORD	351	3.54	55.98	697.04	3.66	0.79	4.45	4.59	0.30	11.1
122	71	PLYM	360	4.45	77.65	570.17	4.13	1.02	5.15	5.26	5.00	12.6
124	71	FORD	302	3.42	24.26	631.83	2.86	0.47	3.33	3.35	0.20	13.0
125	72	VOLK	97	2.16	9.77	355.99	5.15	1.73	6.89	6.93	0.10	23.5
126	72	FORD	429	3.40	27.77	667.41	5.08	1.45	6.53	6.38	1.98	12.3
127	72	PONT	400	4.42	78.53	629.57	3.02	0.50	3.52	4.15	8.40	11.6
128	71	BUIC	350	2.54	46.84	804.87	3.75	0.96	4.71	4.42	1.25	10.0
129	71	CHEV	307	3.78	44.45	641.18	3.82	0.86	4.68	5.51	4.55	12.3
130	68	CADI	472	1.96	31.52	869.71	3.34	0.67	4.01	3.83	0.50	9.6
131	71	DODG	225	2.93	50.18	400.30	5.06	1.76	6.82	6.38	8.00	18.2
131R	71	DODG	225	2.84	43.79	394.05	4.87	1.48	6.35	5.98	8.00	18.8
132	72	FORD	351	3.53	19.60	690.54	5.60	1.83	7.43	7.15	1.50	12.1
133	71	CHEV	307	3.55	26.74	578.44	4.13	1.23	5.36	5.27	7.20	14.0
134	71	DODG	383	12.16	212.15	552.64	1.61	0.24	1.85	1.84	7.70	9.6
135	71	PLYM	318	2.87	22.27	568.73	3.98	0.83	4.41	3.95	2.20	14.5
137	72	PLYM	225	2.81	30.65	422.18	3.84	1.09	4.93	4.71	3.50	18.5
138	72	PLYM	340	5.11	69.85	493.13	3.52	1.08	4.60	4.28	3.10	14.3
140	72	DODG	318	3.26	25.91	472.78	4.10	0.76	4.86	4.60	1.60	16.9
141	67	CHEV	230	15.27	130.34	364.70	1.65	0.35	2.00	2.07	9.10	14.4
142	69	FORD	302	3.40	17.34	510.41	9.06	0.06	9.12	9.89	1.75	16.2
144	71	FORD	400	3.92	79.47	621.19	4.82	1.83	6.65	6.39	10.00	11.7
145	70	FORD	351	4.41	63.54	616.04	3.47	1.13	4.60	4.09	4.80	12.2
145R	70	FORD	351	4.95	74.00	587.17	3.80	1.02	4.82	4.38	4.80	12.3
146	71	OPEL	66	2.55	29.44	311.59	3.97	0.96	4.93	4.26	7.35	24.3
147	71	FORD	351	5.20	46.38	617.15	5.94	2.55	8.49	7.71	0.60	12.6
148	72	FORD	400	3.69	23.20	705.98	4.85	1.27	6.12	5.57	2.20	11.8
148R	72	FORD	400	3.89	35.49	729.43	4.93	1.39	6.32	5.94	2.20	11.1
149	71	VOLK	97	4.57	60.88	287.06	1.79	0.23	2.02	1.97	3.20	22.4
151	72	CHEV	350	4.23	43.14	658.70	2.32	0.30	2.62	2.43	6.75	12.0
152	71	CHEV	400	2.86	20.22	644.94	4.37	1.27	5.64	5.34	0.20	12.6
153	71	CHEV	307	5.63	23.16	515.11	5.23	1.64	6.87	6.33	8.30	15.6
154	70	DODG	383	33.42	63.24	543.40	5.91	2.93	8.84	8.93	8.00	11.9
155	71	VOLK	97	4.57	59.91	319.79	2.21	0.29	2.50	2.55	2.20	20.7
157	72	CHEV	307	2.98	10.34	585.24	3.61	0.86	4.19	4.19	1.75	14.5
158	66	BUIC	340	7.05	177.01	437.56	1.58	0.34	1.92	1.69	5.50	12.0

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TABLE 13B

EXHAUST EMISSION TEST RESULTS IN GRAMS PER MILE

ST LOUIS

1975 TEST PROCEDURE

CAR	YR	MAKE	CID	HC	CO	CO2	NO	NO2	NOX	NOXC	ICO	FUEL ECON
159	72	PONT	350	4.03	83.38	708.31	3.78	0.98	4.76	4.46	9.60	10.4
160	68	FORD	390	4.36	60.67	582.78	6.03	2.59	8.62	7.91	1.10	12.8
162	72	OLDS	350	3.30	35.27	692.17	4.24	1.27	5.51	5.58	2.50	11.7
164	71	BUIC	350	3.97	73.51	692.34	3.71	0.97	4.68	4.60	0.20	10.8
165	72	CHEV	350	2.19	10.35	617.91	2.88	0.58	3.46	3.27	1.20	13.8
165R	72	CHEV	350	1.85	10.49	606.57	2.93	0.64	3.57	3.26	1.20	14.1
166	70	FORD	250	4.01	55.68	402.00	5.45	2.09	7.54	6.79	5.80	17.7
166R	70	FORD	250	3.90	54.64	408.90	5.27	2.06	7.33	6.45	5.80	17.5
167	70	CHEV	350	3.63	56.94	669.58	2.92	0.58	3.50	3.17	2.75	11.5
168	71	MERC	400	8.99	128.52	513.31	3.88	1.01	4.89	4.39	10.00	11.9
169	70	TOYO	113	8.70	81.42	331.50	2.68	0.47	3.15	2.94	4.25	18.2
170	71	CHEV	140	1.99	30.12	358.00	3.94	1.09	5.03	4.75	0.20	21.6
171	71	CHEV	307	8.81	38.17	562.00	2.72	0.55	3.27	3.41	2.80	13.7
172	72	FORD	351	2.47	28.45	750.29	4.45	1.38	5.83	6.66	0.20	11.1
173	71	DATS	97	5.73	74.42	269.09	2.69	0.57	3.26	2.85	6.40	22.0
174	67	FORD	289	4.90	94.99	430.54	2.20	0.27	2.47	2.96	9.90	14.9
175	66	PONT	326	8.93	43.26	488.76	3.08	0.57	3.65	3.22	1.60	15.2
176	70	FORD	302	3.97	23.39	641.12	3.36	0.76	4.12	4.02	0.25	12.9
177	70	PONT	350	6.85	44.57	629.23	3.94	1.14	5.08	5.00	2.50	12.3
178	70	BUIC	455	5.24	87.34	706.16	5.08	1.57	6.65	6.58	6.30	10.3
179	72	FORD	351	2.75	40.40	657.48	4.53	1.16	5.69	5.72	0.85	12.2
180	68	PONT	350	3.70	46.44	644.98	3.95	0.91	4.86	5.03	1.25	12.2
181	67	PONT	326	5.84	67.57	529.37	4.05	1.21	5.26	5.23	3.40	13.6
182	67	MERC	390	7.15	52.20	657.65	2.78	0.53	3.31	3.28	3.00	11.6
183	66	PLYM	225	6.57	111.19	425.57	1.09	0.06	1.15	1.26	2.35	14.3
184	72	CHEV	454	2.56	32.66	751.53	4.47	1.48	5.95	5.79	1.20	10.9
185	71	OLDS	350	3.49	47.76	563.01	4.05	1.03	5.08	4.80	3.45	13.7
186	71	PONT	350	3.87	77.82	691.31	3.29	1.06	4.35	4.29	4.50	10.7
187	67	BUIC	340	6.99	129.24	468.24	1.36	0.28	1.64	1.52	3.90	12.8
188	71	CHEV	402	2.56	9.19	745.03	4.07	1.52	5.59	5.35	0.20	11.6

3.3 VEHICLE EVAPORATIVE EMISSIONS RESULTS

Data for the diurnal loss and hot soak loss SHED evaporative emissions tests are included in this section. Test fuel inspection information for each test is also included. Reid vapor pressure (RVP) in pounds per square inch was obtained by the ASTM D323 test method. The ASTM D86 test method was used to obtain the fuel distillation properties.

The following is a description of the headings used in this section.

HEADING	DESCRIPTION
DIURNAL	Diurnal breathing losses are fuel vapors emitted as a result of an increase in fuel tank temperature in a specified time.
HOT SOAK	Hot soak losses are fuel vapor emitted during a specified period beginning immediately after the engine is turned off and sealed in the SHED enclosure.
TIME	The time in minutes required to heat the tank fuel $24 \pm 1^{\circ}\text{F}$ at a constant rate during the period of 60 minutes.
ENC TEMP (DIURNAL)	The enclosure interior air temperature as $^{\circ}\text{F}$, measured by a thermocouple installed 6 inches below the geometric center of the ceiling. The interior temperature is held between 68°F and 86°F .
INT TEMP	The internal tank fuel temperature measured as $^{\circ}\text{F}$ by a thermocouple installed near the geometric center of the tank fuel liquid. This temperature is recorded as the final maximum temperature of the tank fuel.
HC/GMS	Calculated weight of emissions as grams. The emissions are calculated from the net hydrocarbon concentration of the enclosure in ppm carbon.
ENC TEMP (HOT SOAK)	Same as ENC TEMP (DIURNAL) above except the interior temperature should be held between 76°F and 90°F .
RVP	Reid Vapor Pressure, measured at 100°F - pounds per square inch gauge.
H/C	Hydrogen - carbon atom ratio
IBP	Initial Boiling Point
FBP	Final Boiling Point

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CAR.	DIURNAL				HEAT SOAK				RVP	H/C	IRP	5%	10%	15%	20%	30%	40%	50%	30% FBP	
	Time	Encl. Temp.	Int. Temp.	HC grams	Time	Encl. Temp.	Int. Temp.	HC grams												
9	60	76.0	84.0	5.08	60	90.0	102.0	19.36	8.1	2.544	94	113	130	144	157	186	208	222	309	352
12	60	78.0	84.0	9.79	60	79.0	86.0	5.29	8.3	2.506	93	115	128	140	154	186	208	222	310	354
16	60	80.0	85.0	11.54	60	84.0	94.0	7.15	9.8	2.45	91	105	120	135	147	174	199	218	303	346
26	60	80.0	84.0	20.40	60	86.0	87.0	14.30	9.7	2.45	87	103	116	127	138	166	195	214	307	344
28	60	80.0	84.0	20.33	60	88.0	94.0	20.11	9.6	2.45	90	108	124	138	150	175	200	222	308	340
112	60	74.0	83.0	16.83	60	86.3	94.1	7.69	8.2	2.486	94	115	134	149	163	189	210	229	313	364
133	60	77.0	84.0	4.91	60	83.0	95.0	14.41	8.1	2.516	93	115	128	138	149	178	206	223	305	354
140	60	73.0	84.0	14.24	60	87.0	100.0	15.47	9.1	2.453	91	113	131	147	163	191	209	224	315	364
143	60	77.0	84.0	4.62	60	84.0	88.0	8.58	9.1	2.489	92	114	133	149	166	193	211	225	316	365
146	60	74.0	84.0	6.75	60	85.0	97.0	7.52	8.2	2.480	94	114	128	143	156	186	208	222	309	355
153	60	80.0	84.0	9.74	60	90.0	94.0	15.86	9.0	2.470	93	114	132	147	163	191	209	224	317	366
156	60	77.0	84.0	11.50	60	88.0	93.0	16.99	9.0	2.470	93	114	132	147	163	191	209	224	317	366
158	60	80.0	83.0	4.08	60	89.0	99.0	7.76	8.8	2.469	93	113	133	144	164	192	211	227	317	370
163	60	73.0	84.0	16.55	60	88.0	99.0	13.56	8.8	2.469	93	113	133	144	164	192	211	227	317	370
164	60	75.0	83.0	10.34	60	77.0	80.0	2.49	8.5	2.457	94	116	134	150	163	190	212	232	315	363
169	60	74.0	85.0	37.53	60	87.0	99.0	22.16	8.2	2.462	93	112	130	145	160	184	204	219	303	354

TABLE 14

SHED Test Procedures

TABLE 14 (cont.)